

REPUBLIC OF KENYA



PARLIAMENT OF KENYA

PARLIAMENTARY SERVICE COMMISSION (PSC)

PARLIAMENTARY JOINT SERVICES,

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TENDER DOCUMENT

TENDER NO. PJS/012/2021-2022

TENDER FOR THE CONSTRUCTION OF THE PROPOSED CENTRE
FOR PARLIAMENTARY STUDIES AND TRAINING (CPST) ON PLOT
LR. NO. 28172, KAREN, NAIROBI.

TENDER SUBMISSION DEADLINE: 17th DECEMBER, 2021

TABLE OF CONTENTS

Contents

TABLE OF CONTENTS	2
INVITATION TO TENDER	4
Address for obtaining further information and for purchasing tender documents	5
Address for Submission of Tenders.....	5
Address for Opening of Tenders.....	5
SECTION I - INSTRUCTIONS TO TENDERERS	1
A) GENERAL PROVISIONS.....	1
B) CONTENTS OF TENDER DOCUMENTS	4
C) PREPARATION OF TENDERS.....	6
D) SUBMISSION AND OPENING OF TENDERS.....	11
E. EVALUATION AND COMPARISION OF TENDERS	13
F. AWARD OF CONTRACT	18
SECTION II – TENDER DATA SHEET (TDS).....	20
SECTION III - EVALUATION AND QUALIFICATION CRITERIA	24
TENDER EVALUATION CRITERIA.....	28
STAGE 1. PRELIMINARY EVALUATION.....	28
STAGE 2. TECHNICAL EVALUATION CRITERIA FOR THE CANDIDATE.....	33
1. FOREIGN TENDERERS 40%RULE	43
2. FORMEQU: EQUIPMENT.....	44
3. FORM PER -1.....	45
4. FORM PER - 2:.....	46
5. TENDERERS QUALIFICATION WITHOUT PREQUALIFICATION	48
5.1 FORM ELI -1.1 Tenderer.....	48
5.2 FORM ELI -1.2.....	49
5.3 FORM CON –2.....	50
5.4 FORM FIN – 3.1:	52

5.5	FORM FIN – 3.2:	54
5.6	FORM FIN – 3.3:	55
5.7	FORM FIN – 3.4:	56
No.		56
Name of Contract		56
Procuring Entity's		56
5.8	FORM EXP - 4.1	57
5.9	FORM EXP - 4.2(a)	58
5.9	FORM EXP - 4.2 (a) (cont.)	58
5.10	FORM EXP - 4.2(b)	59
6.	FORM OF TENDER	61
b)	CERTIFICATE OF INDEPENDENT TENDER DETERMINATION	69
(c)	SELF- DECLARATION FORMS	71
	FORM SD1	71
	FORM SD2	72
	DECLARATION AND COMMITMENT TO THE CODE OF ETHICS	73
(d)	APPENDIX 1 - FRAUD AND CORRUPTION	74
	FORM OF TENDER SECURITY-[Option 1–Demand Bank Guarantee]	78
	FORMAT OF TENDER SECURITY [Option 2–Insurance Guarantee] - NOT APPLICABLE	79
	TENDER SECURING DECLARATION	80
PART II	- WORKS REQUIREMENTS	81
PART III	- THE CONDITIONS OF CONTRACT AND CONTRACT	73
	FORM NO. 9 BENEFICIAL OWNERSHIP DISCLOSURE FORM	143
	SECTION XI – TERMS OF REFERENCE	145

INVITATION TO TENDER

PROCURING ENTITY: **Parliamentary Joint Services**

**THE DIRECTOR GENERAL,
PARLIAMENTARY JOINT SERVICES,
PARLIAMENT BUILDINGS, PARLIAMENT ROAD ,
P.O. BOX 41842 00100,
Nairobi, Kenya.
Tel: +254 020 2221291
Email: DG@parliament.go.ke
Website: www.parliament.go.ke**

CONTRACT NAME AND DESCRIPTION: CONSTRUCTION OF THE PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING ON LR NO. 28172, KAREN, NAIROBI.

1. The **Parliamentary Joint Services** invites sealed tenders for the **Construction of the Proposed Centre for Parliamentary Studies and Training on Plot L.R. No.28172, Karen, Nairobi.**
2. Tendering will be conducted under open competitive method using a standardized tender document. Tendering is open to all qualified and interested Tenderers.
3. Qualified and interested tenderers may obtain further information and inspect the Tender Documents during office hours; **0800 to 1700 hours** at **Procurement Office on 4th Floor, Protection House, Nairobi** or email through procurementpjs@parliament.go.ke.
4. A complete set of tender documents may be obtained electronically from the **Commission's Website; www.parliament.go.ke or Public Procurement Information Portal www.tenderd.go.ke** Tender documents obtained electronically will be free of charge.
5. Tender documents may be viewed and downloaded for free from the **Commission's Website; www.parliament.go.ke or Public Procurement Information Portal www.tenderd.go.ke.** Tenderers who download the tender document must forward their particulars immediately through email to procurementpjs@parliament.go.ke, **Tel: +254 020 2221291** to facilitate any further clarification or addendum.
6. Tenders shall be quoted be in Kenya Shillings and shall include all taxes. Tenders shall remain valid for **182 days** from the date of opening of tenders.
7. All Tenders must be accompanied by a Tender Security of **Kenya Shillings Thirty Million (Kshs. 30,000,000.00)** only valid for **217 days** from the date of tender opening, in the form of Bank guarantee from a reputable bank recognized by central bank of Kenya payable to Parliamentary Joint Services.
8. The Tenderer shall chronologically serialize all pages of the tender documents submitted.
9. Completed tenders must be delivered to the address below on or before **17th December, 2021. at 11:00 A.M.**
10. Electronic Tenders WILL NOT be permitted.

11. Tenders will be opened immediately after the deadline date and time specified above. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.
12. Late tenders will be rejected.
13. The addresses referred to above are:

Address for obtaining further information and for purchasing tender documents

THE DIRECTOR GENERAL,
PARLIAMENTARY JOINT SERVICES,
PARLIAMENT BUILDINGS, PARLIAMENT ROAD,
P.O. BOX 41842 00100,
Nairobi, Kenya.

Tel: +254 020 2221291

Email: DG@parliament.go.ke

Website(s): www.parliament.go.ke, www.tenderd.go.ke

Address for Submission of Tenders.

The completed tender documents will be hand-delivered to the Tender Box at the **Reception on 2nd Floor, Protection House, Nairobi** or be addressed to:

THE DIRECTOR GENERAL,
PARLIAMENTARY JOINT SERVICES,
PARLIAMENT BUILDINGS,
P.O. BOX 41842-00100,
NAIROBI, KENYA.

Address for Opening of Tenders.

2ND FLOOR BOARDROOM,
PROTECTION HOUSE,
PARLIAMENT BUILDINGS,
NAIROBI, KENYA.

**DIRECTOR GENERAL
PARLIAMENTARY JOINT SERVICES**

Date: 19th November, 2021.

PART 1: TENDERING PROCEDURES

SECTION I - INSTRUCTIONS TO TENDERERS

A) GENERAL PROVISIONS

10 Scope of tender

11 The Procuring Entity as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The name, identification, and number of lots (contracts) of this Tender Document are specified in the TDS.

12 Throughout this tendering document:

- a) The term “inwriting” means communicated in written form (e.g. by mail, e-mail, fax, including if specified in the TDS, distributed or received through the electronic-procurement system used by the Procuring Entity) with proof of receipt;
- b) if the context so requires, “singular” means “plural” and vice versa;
- c) “Day” means calendar day, unless otherwise specified as “Business Day”. A Business Day is any day that is an official working day of the Procuring Entity. It excludes official public holidays.

20 Fraud and corruption

21 The Procuring Entity requires compliance with the provisions of the Public Procurement and Asset Disposal Act, 2015, Section 62 “Declaration not to engage in corruption”. The tender submitted by a person shall include a declaration that the person shall not engage in any corrupt or fraudulent practice and a declaration that the person or his or her sub-contractors are not debarred from participating in public procurement proceedings.

22 The Procuring Entity requires compliance with the provisions of the Competition Act 2010, regarding collusive practices in contracting. Any tenderer found to have engaged in collusive conduct shall be disqualified and criminal and/or civil sanctions may be imposed. To this effect, Tenders shall be required to complete and sign the “Certificate of Independent Tender Determination” annexed to the Form of Tender.

23 Tenderers shall permit and shall cause their agents (whether declared or not), subcontractors, sub-consultants, service providers, suppliers, and their personnel, to permit the Procuring Entity to inspect all accounts, records and other documents relating to any initial selection process, pre-qualification process, tender submission, proposal submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Procuring Entity.

24 Unfair Competitive Advantage - Fairness and transparency in the tender process require that the firms or their Affiliates competing for a specific assignment do not derive a competitive advantage from having provided consulting services related to this tender. To that end, the Procuring Entity shall indicate in the **Data Sheet** and make available to all the firms together with this tender document all information that would in that respect give such firm any unfair competitive advantage over competing firms.

30 Eligible tenderers

31 A Tenderer may be a firm that is a private entity, a state-owned enterprise or institution subject to ITT 3.8, or an individual or any combination of such entities in the form of a joint venture (JV) under an existing agreement with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the tendering process and, in the event the JV is awarded the Contract, during contract execution. Members of a joint venture may not also make an individual tender, be a subcontractor in a separate tender or be part of another joint venture for the purposes of the same Tender. The maximum number of JV members shall be specified in the

TDS.

- 32** Public Officers of the Procuring Entity, their Spouses, Child, Parent, Brothers or Sister. Child, Parent, Brother or Sister of a Spouse, their business associates or agents and firms/organizations in which they have a substantial or controlling interest shall not be eligible to tender or be awarded a contract. Public Officers are also not allowed to participate in any procurement proceedings.
- 33** A Tenderer shall not have a conflict of interest. Any tenderer found to have a conflict of interest shall be disqualified. A tenderer may be considered to have a conflict of interest for the purpose of this tendering process, if the tenderer;
- a) Directly or indirectly controls, is controlled by or is under common control with another tenderer;
 - b) Receives or has received any director indirect subsidy from another tenderer;
 - c) Has the same legal representative as another tenderer;
 - d) Has a relationship with another tenderer, directly or through common third parties, that puts it in a position to influence the tender of another tenderer, or influence the decisions of the Procuring Entity regarding this tendering process;
 - e) Any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the goods or works that are the subject of the tender;
 - f) Any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as a consultant for Contract implementation;
 - g) Would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the contract specified in this Tender Document;
 - h) Has a close business or personal relationship with senior management or professional staff of the Procuring Entity who has the ability to influence the bidding process and:
 - i. Are directly or indirectly involved in the preparation of the Tender document or specifications of the Contract, and/or the Tender evaluation process of such contract; or
 - ii. May be involved in the implementation or supervision of such Contract unless the conflicts stemming from such relationship has been resolved in a manner acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.
- 34** A tenderer shall not be involved in corrupt, coercive, obstructive or fraudulent practice. A tenderer that is proven to have been involved in any of these practices shall be automatically disqualified
- 35** A Tenderer (either individually or as a JV member) shall not participate in more than one Tender, except for permitted alternative tenders. This includes participation as a subcontractor in other Tenders. Such participation shall result in the disqualification of all Tenders in which the firm is involved. Members of a joint venture may not also make an individual tender, be a sub-contractor in a separate tender or be part of another joint venture for the purposes of the same Tender. A firm that is not a tenderer or a JV member may participate as a subcontractor in more than one tender.
- 36** A Tenderer may have the nationality of any country, subject to the restrictions pursuant to ITT3.9. A Tenderer shall be deemed to have the nationality of a country if the Tenderer is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed sub-contractors or sub-consultants for any part of the Contract including related Services.
- 37** A Tenderer that has been debarred from participating in public procurement shall be ineligible to

tender or be awarded a contract. The list of debarred firms and individuals is available from the website of PPRA www.ppra.go.ke.

- 38** A Tenderer that is a state-owned enterprise or a public institution in Kenya may be eligible to tender and be awarded Contract(s) only if it is determined by the Procuring Entity to meet the following conditions, i.e. if it is:
- i) A legal public entity of Government and/or public administration,
 - ii) financially autonomous and not receiving any significant subsidies or budget support from any public entity or Government, and;
 - (iii) operating under commercial law and vested with legal rights and liabilities similar to any commercial enterprise to enable it compete with firms in the private sector on an equal basis.

- 39** Firms and individuals shall be ineligible if their countries of origin are:
- (a) As a matter of law or official regulations, Kenya prohibits commercial relations with that country;
 - (b) By an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country.

A tenderer shall provide such documentary evidence of eligibility satisfactory to the Procuring Entity, as the Procuring Entity shall reasonably request.

- 3.10** Foreign tenderers are required to source at least forty (40%) percent of their contract inputs (in supplies, local sub-contracts and labor) from citizen suppliers and contractors. To this end, a foreign tenderer shall provide in its tender documentary evidence that this requirement is met. Foreign tenderers not meeting this criterion will be automatically disqualified. Information required to enable the Procuring Entity determine if this condition is met shall be provided for this purpose in *“SECTION II - EVALUATION AND QUALIFICATION CRITERIA, Item 9”*.

- 3.11** Pursuant to the eligibility requirements of ITT 3.10, a tender is considered a foreign tenderer, if it is registered in Kenya and has less than 51 percent ownership by nationals of Kenya and if it does not subcontract to foreign firms or individuals more than 10 percent of the contract price, excluding provisional sums. JVs are considered as foreign tenderers if the individual member firms registered in Kenya have less 51 percent ownership by nationals of Kenya. The JV shall not subcontract to foreign firms more than 10 percent of the contract price, excluding provisional sums.

- 3.12** The National Construction Authority Act of Kenya requires that all local and foreign contractors be registered with the National Construction Authority and be issued with a Registration Certificate before they can undertake any construction works in Kenya. Registration shall not be a condition for tender, but it shall be a condition of contract award and signature. A selected tenderer shall be given opportunity to register before such award and signature of contract. Application for registration with National Construction Authority may be accessed from the website www.nca.go.ke.

- 3.13** The Competition Act of Kenya requires that firms wishing to tender as Joint Venture undertakings which may prevent, distort or lessen competition in provision of services are prohibited unless they are exempt in accordance with the provisions of Section 25 of the Competition Act, 2010. JVs will be required to seek for exemption from the Competition Authority. Exemption shall not be a condition for tender, but it shall be a condition of contract award and signature. A JV tenderer shall be given opportunity to seek such exemption as a condition of award and signature of contract. Application for exemption from the Competition Authority of Kenya may be accessed from the website www.cak.go.ke.

- 4.14 A Kenyan tenderer shall be eligible to tender if it provides evidence of having fulfilled his/her tax obligations by producing valid tax compliance certificate or tax exemption certificate issued by the Kenya Revenue Authority.

40 Eligible goods, equipment, and services

- 41** Goods, equipment and services to be supplied under the Contract may have their origin in any country that is not ineligible under ITT 3.9. At the Procuring Entity's request, Tenderers may be required to provide evidence of the origin of Goods, equipment and services.
- 42** Any goods, works and production processes with characteristics that have been declared by the relevant national environmental protection agency or by other competent authority as harmful to human beings and to the environment shall not be eligible for procurement.

5.0 Tenderer's responsibilities

- 5.1** The tenderer shall bear all costs associated with the preparation and submission of his/her tender, and the Procuring Entity will in no case be responsible or liable for those costs.
- 5.2** The tenderer, at the tenderer's own responsibility and risk, is encouraged to visit and examine and inspect the Site of the Works and its surroundings and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be the tenderer's own expense.
- 5.3** The Tenderer and any of its personnel or agents will be granted permission by the Procuring Entity to enter upon its premises and lands for the purpose of such visit. The Tenderer shall indemnify the Procuring Entity against all liability arising from death or personal injury, loss of or damage to property, and any other losses and expenses incurred as a result of the examination and inspection.
- 5.4** The tenderer shall provide in the Form of Tender and Qualification Information, a preliminary description of the proposed work method and schedule, including charts, as necessary or required.

B) CONTENTS OF TENDER DOCUMENTS

6.0 Sections of Tender Document

- 6.1** The tender document consists of Parts 1, 2, and 3, which includes all the sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITT 10.

PART 1: Tendering Procedures

Section I – Instructions to Tenderers

Section II – Tender Data Sheet (TDS)

Section III- Evaluation and Qualification Criteria Section IV – Tendering Forms

PART 2: Works' Requirements Section V - Bills of Quantities Section VI - Specifications

Section VII – Drawings

PART 3: Conditions of Contract and Contract Forms

Section VIII - General Conditions (GCC)

Section IX - Special Conditions of Contract

Section X- Contract Forms

- 6.2** The Invitation to Tender Notice issued by the Procuring Entity is not part of the Contract documents. Unless obtained directly from the Procuring Entity, the Procuring Entity is not responsible for the completeness of the Tender document, responses to requests for clarification, the minutes of a pre-arranged site visit and those of the pre-Tender meeting (if any), or Addenda to the Tender document in accordance with ITT 10. In case of any contradiction, documents obtained directly from the Procuring Entity shall prevail.
- 6.3** The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document and to furnish with its Tender all information and documentation as is required by the Tender document.

7.0 Clarification of Tender Document, Site Visit, Pre-tender Meeting

- 7.1** A Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address specified in the **TDS** or raise its enquiries during the pre-Tender meeting if provided for in accordance with ITT 7.2. The Procuring Entity will respond in writing to any request for clarification, provided that such request is received no later than the period specified in the **TDS** prior to the deadline for submission of tenders. The Procuring Entity shall forward copies of its response to all tenderers who have acquired the Tender documents in accordance with ITT 7.4, including a description of the inquiry but without identifying its source. If so specified in the **TDS**, the Procuring Entity shall also promptly publish its response at the web page identified in the **TDS**. Should the clarification result in changes to the essential elements of the Tender Documents, the Procuring Entity shall amend the Tender Documents following the procedure under ITT 8 and ITT 22.2.
- 7.2** The Tenderer, at the Tenderer's own responsibility and risk, is encouraged to visit and examine and inspect the site(s) of the required contracts and obtain all information that may be necessary for preparing a tender. The costs of visiting the Site shall be at the Tenderer's own expense. The Procuring Entity shall specify in the **TDS** if a pre-arranged Site visit and or a pre-tender meeting will be held, when and where. The Tenderer's designated representative is invited to attend a pre-arranged site visit and a pre-tender meeting, as the case may be. The purpose of the site visit and the pre-tender meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 7.3** The Tenderer is requested to submit any questions in writing, to reach the Procuring Entity not later than the period specified in the **TDS** before the meeting.
- 7.4** Minutes of a pre-arranged site visit and those of the pre-tender meeting, if applicable, including the text of the questions asked by Tenderers and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Tenderers who have acquired the Tender Documents. Minutes shall not identify the source of the questions asked.
- 7.5** The Procuring Entity shall also promptly publish anonymized (*no names*) Minutes of the pre-arranged site visit and those of the pre-tender meeting at the web page identified in the **TDS**. Any modification to the Tender Documents that may become necessary as a result of the pre-arranged site visit and those of the pre-tender meeting shall be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT 8 and not through the minutes of the pre-Tender meeting. Non-attendance at the pre-arranged site visit and the pre-tender meeting will not be a cause for disqualification of a Tenderer.

8.0 Amendment of Tender Documents

- 8.1** At any time prior to the deadline for submission of Tenders, the Procuring Entity may amend the Tender Documents by issuing addenda.
- 8.2** Any addendum issued shall be part of the Tender Documents and shall be communicated in writing to all who have obtained the Tender Documents from the Procuring Entity. The Procuring Entity shall also promptly publish the addendum on the Procuring Entity's website in accordance with ITT 7.5.
- 8.3** To give Tenderers reasonable time in which to take an addendum into account in preparing their Tenders, the Procuring Entity should extend the dead line for the submission of Tenders, pursuant to ITT 22.2.

C) PREPARATION OF TENDERS

9.0. Cost of Tendering

The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.

10.0. Language of Tender

The Tender, as well as all correspondence and documents relating to the tender exchanged by the tenderer and the Procuring Entity, shall be written in the English Language. Supporting documents and printed literature that are part of the Tender may be in another language provided they are accompanied by an accurate and notarized translation of the relevant passages into the English Language, in which case, for purposes of interpretation of the Tender, such translation shall govern.

11.0. Documents Comprising the Tender

11.1 The Tender shall comprise the following:

- a) Form of Tender prepared in accordance with ITT 12;
- b) Schedules including priced Bill of Quantities, completed in accordance with ITT 12 and ITT 14;
- c) Tender Security or Tender-Securing Declaration, in accordance with ITT 19.1;
- d) Alternative Tender, if permissible, in accordance with ITT 13;
- e) **Authorization**: written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT 20.3;
- f) **Qualifications**: documentary evidence in accordance with ITT 17 establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted;
- g) **Conformity**: a technical proposal in accordance with ITT 16;
- h) Any other document required in the **TDS**.

11.2 In addition to the requirements under ITT 11.1, Tenders submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender, together with a copy of the proposed JV Agreement. Change of membership and conditions of the JV prior to contract signature will render the tender liable for disqualification.

12.0 Form of Tender and Schedules

12.1 The Form of Tender and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Tendering Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITT 20.3. All blank spaces shall be filled in with the information requested. The Tenderer shall chronologically serialize all pages of the tender documents submitted.

12.2 The Tenderer shall furnish in the Form of Tender information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Tender.

13. Alternative Tenders

13.1 Unless otherwise specified in the TDS, alternative Tenders shall not be considered.

13.2 When alternative times for completion are explicitly invited, a statement to that effect will be

included in the **TDS**, and the method of evaluating different alternative times for completion will be described in Section III, Evaluation and Qualification Criteria.

- 133 Except as provided under ITT 13.4 below, Tenderers wishing to offer technical alternatives to the requirements of the Tender Documents must first price the Procuring Entity's design as described in the Tender Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the Tenderer with the Winning Tender conforming to the basic technical requirements shall be considered by the Procuring Entity.
- 134 When specified in the **TDS**, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the **TDS**, as will the method for their evaluating, and described in Section VII, Works' Requirements.

140 Tender Prices and Discounts

- 141 The prices and discounts (including any price reduction) quoted by the Tenderer in the Form of Tender and in the Bill of Quantities shall conform to the requirements specified below.
- 142 The Tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Tenderer shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Procuring Entity. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Tender, and provided that the Tender is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive Tenderers will be added to the Tender price and the equivalent total cost of the Tender so determined will be used for price comparison.
- 143 The price to be quoted in the Form of Tender, in accordance with ITT 12.1, shall be the total price of the Tender, including any discounts offered.
- 144 The Tenderer shall quote any discounts and the methodology for their application in the Form of Tender, in accordance with ITT 12.1.
- 145 It will be specified in the **TDS** if the rates and prices quoted by the Tenderer are or are not subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, except in cases where the contract is subject to fluctuations and adjustments, not fixed price. In such a case, the Tenderer shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Procuring Entity may require the Tenderer to justify its proposed indices and weightings.
- 146 Where tenders are being invited for individual lots (contracts) or for any combination of lots (packages), tenderers wishing to offer discounts for the award of more than one Contract shall specify in their Tender the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITT 14.4, provided the Tenders for all lots (contracts) are opened at the same time.
- 147 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 30 days prior to the deadline for submission of Tenders, shall be included in the rates and prices and the total Tender Price submitted by the Tenderer.

150 Currencies of Tender and Payment

- 151 The currency(ies) of the Tender and the currency(ies) of payments shall be the same.
- 152 Tenderers shall quote entirely in Kenya Shillings. The unit rates and the prices shall be quoted

by the Tenderer in the Bill of Quantities, entirely in Kenya shillings.

- a) A Tenderer expecting to incur expenditures in other currencies for inputs to the Works supplied from outside Kenya (referred to as “the foreign currency requirements”) shall (if so allowed in the TDS) indicate in the Appendix to Tender the percentage(s) of the Tender Price (excluding Provisional Sums), needed by the Tenderer for the payment of such foreign currency requirements, limited to no more than two foreign currencies.
- b) The rates of exchange to be used by the Tenderer in arriving at the local currency equivalent and the percentage(s) mentioned in (a) above shall be specified by the Tenderer in the Appendix to Tender and shall be based on the exchange rate provided by the Central Bank of Kenya on the date 30 days prior to the actual date of tender opening. Such exchange rate shall apply for all foreign payments under the Contract.

15.3 Tenderers may be required by the Procuring Entity to justify, to the Procuring Entity's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Schedule of Adjustment Data in the Appendix to Tender are reasonable, in which case a detailed break down of the foreign currency requirements shall be provided by Tenderers.

16.0 Documents Comprising the Technical Proposal

The Tenderer shall furnish a technical proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV, Tender Forms, insufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work's requirements and the completion time.

17.0 Documents Establishing the Eligibility and Qualifications of the Tenderer

17.1 Tenderers shall complete the Form of Tender, included in Section IV, Tender Forms, to establish Tenderer's eligibility in accordance with ITT 4.

17.2 In accordance with Section III, Evaluation and Qualification Criteria, to establish its qualifications to perform the Contract the Tenderer shall provide the information requested in the corresponding information sheets included in Section IV, Tender Forms.

17.3 If a margin of preference applies as specified in accordance with ITT 33.1, national tenderers, individually or in joint ventures, applying for eligibility for national preference shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITT 33.1.

17.4 Tenderers shall be asked to provide, as part of the data for qualification, such information, including details of ownership, as shall be required to determine whether, according to the classification established by the Procuring Entity, a particular contractor or group of contractors qualifies for a margin of preference. Further the information will enable the Procuring Entity identify any actual or potential conflict of interest in relation to the procurement and/or contract management processes, or a possibility of collusion between tenderers, and thereby help to prevent any corrupt influence in relation to the procurement process or contract management.

17.5 The purpose of the information described in ITT 17.4 above overrides any claims to confidentiality which a tenderer may have. There can be no circumstances in which it would be justified for a tenderer to keep information relating to its ownership and control confidential where it is tendering to undertake public sector work and receive public sector funds. Thus, confidentiality will not be accepted by the Procuring Entity as a justification for a Tenderer's failure to disclose, or failure to provide required information on its ownership and control.

17.6 The Tenderer shall provide further documentary proof, information or authorizations that the Procuring Entity may request in relation to ownership and control which information on

any changes to the information which was provided by the tenderer under ITT 6.4. The obligations to require this information shall continue for the duration of the procurement process and contract performance and after completion of the contract, if any change to the information previously provided may reveal a conflict of interest in relation to the award or management of the contract.

17.7 All information provided by the tenderer pursuant to these requirements must be complete, current and accurate as at the date of provision to the Procuring Entity. In submitting the information required pursuant to these requirements, the Tenderer shall warrant that the information submitted is complete, current and accurate as at the date of submission to the Procuring Entity.

17.8 If a tenderer fails to submit the information required by these requirements, its tender will be rejected. Similarly, if the Procuring Entity is unable, after taking reasonable steps, to verify to a reasonable degree the information submitted by a tenderer pursuant to these requirements, then the tender will be rejected.

17.9 If information submitted by a tenderer pursuant to these requirements, or obtained by the Procuring Entity (whether through its own enquiries, through notification by the public or otherwise), shows any conflict of interest which could materially and improperly benefit the tenderer in relation to the procurement or contract management process, then:

- i) If the procurement process is still ongoing, the tenderer will be disqualified from the procurement process,
- ii) if the contract has been awarded to that tenderer, the contract award will be set as (i) depending on the outcome of (iii),
- iii) the tenderer will be referred to the relevant law enforcement authorities for investigation of whether the tenderer or any other persons have committed any criminal offence.

17.10 If a tenderer submits information pursuant to these requirements that is incomplete, inaccurate or out-of-date, or attempts to obstruct the verification process, then the consequences of ITT 17.8 will ensue unless the tenderer can show to the reasonable satisfaction of the Procuring Entity that any such act was not material, or was due to genuine error which was not attributable to the intentional act, negligence or recklessness of the tenderer.

18.0 Period of Validity of Tenders

18.1. Tenders shall remain valid for the Tender Validity period specified in the **TDS**. The Tender Validity period starts from the date fixed for the Tender submission deadline (as prescribed by the Procuring Entity in accordance with ITT 22). A tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.

18.2 In exceptional circumstances, prior to the expiration of the Tender validity period, the Procuring Entity may request Tenderers to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 19, it shall also be extended for thirty (30) days beyond the deadline of the extended validity period. A Tenderer may refuse the request without forfeiting its Tender security. A Tenderer granting the request shall not be required or permitted to modify its Tender.

19.0 Tender Security

19.1 The Tenderer shall furnish as part of its Tender, either a Tender-Securing Declaration or a Tender Security as specified in the **TDS**, in original form and, in the case of a Tender Security, in the amount and currency **specified** in the **TDS**. A Tender-Securing Declaration shall use the form included in Section IV, Tender Forms.

19.2 If a Tender Security is specified pursuant to ITT 19.1, the Tender Security shall be a demand

guarantee in any of the following forms at the Tenderer's option:

- i. cash;
- ii. a bank guarantee;
- iii. a guarantee by an insurance company registered and licensed by the Insurance Regulatory Authority listed by the Authority;
- iv. a guarantee issued by a financial institution approved and licensed by the Central Bank of Kenya, from a reputable source, and an eligible country.

193 If an unconditional bank guarantee is issued by a bank located outside Kenya, the issuing bank shall have a correspondent bank located in Kenya to make it enforceable. The Tender Security shall be valid for thirty (30) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 18.2.

194 If a Tender Security or Tender-Securing Declaration is specified pursuant to ITT 19.1, any Tender not accompanied by a substantially responsive Tender Security or Tender-Securing Declaration shall be rejected by the Procuring Entity as non-responsive.

195 If a Tender Security is specified pursuant to ITT 19.1, the Tender Security of unsuccessful Tenderers shall be returned as promptly as possible upon the successful Tenderer's signing the Contract and furnishing the Performance Security and any other documents required in the TDS. The Procuring Entity shall also promptly return the tender security to the tenderers where the procurement proceedings are terminated, all tenders were determined non-responsive or a bidder declines to extend tender validity period.

196 The Tender Security of the successful Tenderer shall be returned as promptly as possible once the successful Tenderer has signed the Contract and furnished the required Performance Security, and any other documents required in the TDS.

197 The Tender Security may be forfeited or the Tender-Securing Declaration executed:

- a) if a Tenderer withdraws its Tender during the period of Tender validity specified by the Tenderer on the Form of Tender, or any extension there to provided by the Tenderer; or
- b) if the successful Tenderer fails to: -
 - i) sign the Contract in accordance with ITT 47; or
 - ii) furnish a Performance Security and if required in the TDS, and any other documents required in the TDS.

198 Where tender securing declaration is executed, the Procuring Entity shall recommend to the PPRA to debar the Tenderer from participating in public procurement as provided in the law.

199 The Tender Security or the Tender-Securing Declaration of a JV shall be in the name of the JV that submits the Tender. If the JV has not been legally constituted into a legally enforceable JV at the time of tendering, the Tender Security or the Tender-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITT 4.1 and ITT 11.2.

19.10 A tenderer shall not issue a tender security to guarantee itself.

20.0 Format and Signing of Tender

20.1 The Tenderer shall prepare one original of the documents comprising the Tender as described in ITT 11 and clearly mark it "ORIGINAL." Alternative Tenders, if permitted in accordance with ITT 13, shall be clearly marked "ALTERNATIVE." In addition, the Tenderer shall submit copies of the Tender, in the number specified in the TDS and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

- 20.2** Tenderers shall mark as “CONFIDENTIAL” all information in their Tenders which is confidential to their business. This may include proprietary information, trade secrets, or commercial or financially sensitive information.
- 20.3** The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written confirmation as specified in the **TDS** and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialed by the person signing the Tender.
- 20.4** Incase the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
- 20.5** Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.

D) SUBMISSION AND OPENING OF TENDERS

21.0 Sealing and Marking of Tenders

- 21.1** The Tenderer shall deliver the Tender in a single sealed envelope, or in a single sealed package, or in a single sealed container bearing the name and Reference number of the Tender, addressed to the Procuring Entity and a warning not to open before the time and date for Tender opening date. Within the single envelope, package or container, the Tenderer shall place the following separate, sealed envelopes:
- a) in an envelope or package or container marked “ORIGINAL”, all documents comprising the Tender, as described in ITT 11; and
 - b) in an envelope or package or container marked “COPIES”, all required copies of the Tender; and
 - c) if alternative Tenders are permitted in accordance with ITT 13, and if relevant:
 - i. in an envelope or package or container marked “ORIGINAL –ALTERNATIVE TENDER”, the alternative Tender; and
 - ii. in the envelope or package or container marked “COPIES- ALTERNATIVE TENDER”, all required copies of the alternative Tender.

The inner envelopes or packages or containers shall:

- a) bear the name and address of the Procuring Entity,
 - b) bear the name and address of the Tenderer; and
 - c) bear the name and Reference number of the Tender.
- 21.2** If an envelope or package or container is not sealed and marked as required, the *Procuring Entity* will assume no responsibility for the misplacement or premature opening of the Tender. Tenders misplaced or opened prematurely will not be accepted.

22.0 Deadline for Submission of Tenders

- 22.1** Tenders must be received by the Procuring Entity at the address specified in the **TDS** and no later than the date and time also specified in the **TDS**. When so specified in the **TDS**, tenderers shall have the option of submitting their Tenders electronically. Tenderers submitting Tenders electronically shall follow the electronic Tender submission procedures specified in the **TDS**.

22.2 The Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders by amending the Tender Documents in accordance with ITT 8, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline shall thereafter be subject to the deadline as extended.

23.0 Late Tenders

The Procuring Entity shall not consider any Tender that arrives after the deadline for submission of tenders, in accordance with ITT 22. Any Tender received by the Procuring Entity after the deadline for submission of Tenders shall be declared late, rejected, and returned unopened to the Tenderer.

24.0 Withdrawal, Substitution, and Modification of Tenders

24.1 A Tenderer may withdraw, substitute, or modify its Tender after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITT 20.3, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Tender must accompany the respective written notice. All notices must be:

- a) prepared and submitted in accordance with ITT 20 and ITT 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
- b) received by the Procuring Entity prior to the deadline prescribed for submission of Tenders, in accordance with ITT 22.

24.2 Tenders requested to be withdrawn in accordance with ITT 24.1 shall be returned unopened to the Tenderers.

24.3 No Tender may be withdrawn, substituted, or modified in the interval between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Tenderer on the Form of Tender or any extension thereof.

25 Tender Opening

25.1 Except in the cases specified in ITT 23 and ITT 24.2, the Procuring Entity shall publicly open and read out all Tenders received by the deadline, at the date, time and place specified **in the TDS**, in the presence of Tenderers' designated representatives who chooses to attend. Any specific electronic Tender opening procedures required if electronic Tendering is permitted in accordance with ITT 22.1, shall be as specified in the **TDS**.

25.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelopes with the corresponding Tender shall not be opened but returned to the Tenderer. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Tender opening.

25.3 Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned to the Tenderer. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Tender opening.

25.4 Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Tender. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Tender opening.

25.5 Next, all remaining envelopes shall be opened one at a time, reading out: the name of the

Tenderer and whether there is a modification; the total Tender Price, per lot (contract) if applicable, including any discounts and alternative Tenders; the presence or absence of a Tender Security or Tender-Securing Declaration, if required; and any other details as the Procuring Entity may consider appropriate.

25.6 Only Tenders, alternative Tenders and discounts that are opened and read out at Tender opening shall be considered further for evaluation. The Form of Tender and pages of the Bill of Quantities (to be decided on by the tender opening committee) are to be initialed by the members of the tender opening committee attending the opening.

25.7 At the Tender Opening, the Procuring Entity shall neither discuss the merits of any Tender nor reject any Tender (except for late Tenders, in accordance with ITT 23.1).

25.8 The Procuring Entity shall prepare minutes of the Tender Opening that shall include, as a minimum: -

- a) the name of the Tenderer and whether there is a withdrawal, substitution, or modification;
- b) the Tender Price, per lot (contract) if applicable, including any discounts;
- c) any alternative Tenders;
- d) the presence or absence of a Tender Security, if new as required;
- e) number of pages of each tender document submitted.

25.9 The Tenderers' representatives who are present shall be requested to sign the minutes. The omission of a Tenderer's signature on the minutes shall not invalidate the contents and effect of the minutes. A copy of the tender opening register shall be distributed to all Tenderers.

E. EVALUATION AND COMPARISON OF TENDERS

26 Confidentiality

26.1 Information relating to the evaluation of Tenders and recommendation of contract award shall not be disclosed to Tenderers or any other persons not officially concerned with the Tender process until information on Intention to Award the Contract is transmitted to all Tenderers in accordance with ITT 43.

26.2 Any effort by a Tenderer to influence the Procuring Entity in the evaluation of the Tenders or Contract award decisions may result in the rejection of its tender.

26.3 Notwithstanding ITT 26.2, from the time of tender opening to the time of contract award, if tenderer wishes to contact the Procuring Entity on any matter related to the tendering process, it shall do so in writing.

27.0 Clarification of Tenders

27.1 To assist in the examination, evaluation, and comparison of the tenders, and qualification of the tenderers, the Procuring Entity may, at its discretion, ask any tenderer for a clarification of its tender, given a reasonable time for a response. Any clarification submitted by a tenderer that is not in response to a request by the Procuring Entity shall not be considered. The Procuring Entity's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the tender shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Procuring Entity in the evaluation of the tenders, in accordance with ITT 31.

27.2 If a tenderer does not provide clarifications of its tender by the date and time set in the Procuring Entity's request for clarification, its Tender may be rejected.

28.0 Deviations, Reservations, and Omissions

- 28.1 During the evaluation of tenders, the following definitions apply: -
- a) “*Deviation*” is a departure from the requirements specified in the tender document;
 - b) “*Reservation*” is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the tender document; and
 - c) “*Omission*” is the failure to submit part or all of the information or documentation required in the Tender document.

29.0 Determination of Responsiveness

29.1 The Procuring Entity's determination of a Tender's responsiveness is to be based on the contents of the tender itself, as defined in ITT 11.

29.2 A substantially responsive Tender is one that meets the requirements of the Tender document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, if accepted, would:

- a) Affect in any substantial way the scope, quality, or performance of the Works specified in the Contract;
- b) limit in any substantial way, inconsistent with the tender document, the Procuring Entity's rights or the tenderer's obligations under the proposed contract;
- c) if rectified, would unfairly affect the competitive position of other tenderers presenting substantially responsive tenders.

29.3 The Procuring Entity shall examine the technical aspects of the tender submitted in accordance with ITT 16, to confirm that all requirements of Section VII, Works' Requirements have been met without any material deviation, reservation or omission.

29.4 If a tender is not substantially responsive to the requirements of the tender document, it shall be rejected by the Procuring Entity and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

30.0 Non-material non-conformities

30.1 Provided that a tender is substantially responsive, the Procuring Entity may waive any non-conformities in the tender.

30.2 Provided that a Tender is substantially responsive, the Procuring Entity may request that the tenderer submit the necessary information or documentation, within a reasonable period of time, to rectify non-material non-conformities in the tender related to documentation requirements. Requesting information or documentation on such non-conformities shall not be related to any aspect of the price of the tender. Failure of the tenderer to comply with the request may result in the rejection of its tender.

30.3 Provided that a tender is substantially responsive, the Procuring Entity shall rectify quantifiable non-material non-conformities related to the Tender Price. To this effect, the Tender Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component in the manner specified in the TDS.

31.0 Arithmetical Errors

31.1 The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity.

31.2 Provided that the Tender is substantially responsive, the Procuring Entity shall handle errors on the following basis: -

- a) Any error detected if considered a major deviation that affects the substance of the tender, shall lead to disqualification of the tender as non-responsive.
- b) Any errors in the submitted tender arising from a miscalculation of unit price, quantity, subtotal and total bid price shall be considered as a major deviation that affects the substance of the tender and shall lead to disqualification of the tender as non-responsive. and
- c) if there is a discrepancy between words and figures, the amount in words shall prevail

31.3 Tenderers shall be notified of any error detected in their bid during the notification of award.

32.0 Conversion to Single Currency

For evaluation and comparison purposes, the currency(ies) of the Tender shall be converted in to a single currency as specified in the **TDS**.

33.0 Margin of Preference and Reservations

33.1 A margin of preference may be allowed only when the contract is open to international competitive tendering where foreign contractors are expected to participate in the tendering process and where the contract exceeds the value/threshold specified in the Regulations.

33.2 A margin of preference shall not be allowed unless it is specified so in the **TDS**.

33.3 Contracts procured on basis of international competitive tendering shall not be subject to reservations exclusive to specific groups as provided in ITT 33.4.

33.4 Where it is intended to reserve a contract to a specific group of businesses (these groups are Small and Medium Enterprises, Women Enterprises, Youth Enterprises and Enterprises of persons living with disability, as the case may be), and who are appropriately registered as such by the authority to be specified in the **TDS**, a procuring entity shall ensure that the invitation to tender specifically indicates that only businesses or firms belonging to the specified group are eligible to tender. No tender shall be reserved to more than one group. If not so stated in the Invitation to Tender and in the Tender documents, the invitation to tender will be open to all interested tenderers.

34.0 Nominated Subcontractors

34.1 Unless otherwise stated in the **TDS**, the Procuring Entity does not intend to execute any specific elements of the Works by subcontractors selected/nominated by the Procuring Entity. In case the Procuring Entity nominates a subcontractor, the subcontract agreement shall be signed by the Subcontractor and the Procuring Entity. The main contract shall specify the working arrangements between the main contractor and the nominated subcontractor.

34.2 Tenderers may propose sub-contracting up to the percentage of total value of contracts or the volume of works as specified in the **TDS**. Subcontractors proposed by the Tenderer shall be fully qualified for their parts of the Works.

34.3 Domestic subcontractor's qualifications shall not be used by the Tenderer to qualify for the Works unless their specialized parts of the Works were previously designated so by the Procuring Entity in the **TDS** as can be met by subcontractors referred to hereafter as 'Specialized Subcontractors', in which case, the qualifications of the Specialized Subcontractors proposed by the Tenderer may be added to the qualifications of the Tenderer.

35.0 Evaluation of Tenders

35.1 The Procuring Entity shall use the criteria and methodologies listed in this ITT and Section III, Evaluation and Qualification Criteria. No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies the Procuring Entity shall determine

the Lowest Evaluated Tender in accordance with ITT 40.

35.2 To evaluate a Tender, the Procuring Entity shall consider the following:

- a) Price adjustment in accordance with ITT 31.1 (iii); excluding provisional sums and contingencies, if any, but including Daywork items, where priced competitively;
- b) price adjustment due to discounts offered in accordance with ITT 14.4;
- c) converting the amount resulting from applying (a) and (b) above, if relevant, to a single currency in accordance with ITT 32;
- d) price adjustment due to quantifiable non-material non-conformities in accordance with ITT 30.3; and
- e) any additional evaluation factors specified in the **TDS** and Section III, Evaluation and Qualification Criteria.

35.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be considered in Tender evaluation.

35.4 Where the tender involves multiple lots or contracts, the tenderer will be allowed to tender for one or more lots (contracts). Each lot or contract will be evaluated in accordance with ITT 35.2. The methodology to determine the lowest evaluated tenderer or tenderers base done lot (contract) or based on a combination of lots (contracts), will be specified in Section III, Evaluation and Qualification Criteria. In the case of multiple lots or contracts, tenderer will be required to prepare the Eligibility and Qualification Criteria Form for each Lot.

36.0 Comparison of tenders

The Procuring Entity shall compare the evaluated costs of all substantially responsive Tenders established in accordance with ITT 35.2 to determine the Tender that has the lowest evaluated cost.

37.0 Abnormally low tenders and abnormally high tenders

Abnormally Low Tenders

37.1 An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price or that genuine competition between Tenderers is compromised.

37.2 In the event of identification of a potentially Abnormally Low Tender, the Procuring Entity shall seek written clarifications from the Tenderer, including detailed price analyses of its Tender price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Tender document.

37.3 After evaluation of the price analyses, in the event that the Procuring Entity determines that the Tenderer has failed to demonstrate its capability to perform the Contract for the offered Tender Price, the Procuring Entity shall reject the Tender.

Abnormally high tenders

37.4 An abnormally high tender price is one where the tender price, in combination with other constituent elements of the Tender, appears unreasonably too high to the extent that the Procuring Entity is concerned that it (the Procuring Entity) may not be getting value for money or it may be paying too high a price for the contract compared with market prices or that genuine competition between Tenderers is compromised.

37.5 In case of an abnormally high price, the Procuring Entity shall make a survey of the market

prices, check if the estimated cost of the contract is correct and review the Tender Documents to check if the specifications, scope of work and conditions of contract are contributory to the abnormally high tenders. The Procuring Entity may also seek written clarification from the tenderer on the reason for the high tender price. The Procuring Entity shall proceed as follows:

- i. If the tender price is abnormally high based on wrong estimated cost of the contract, the Procuring Entity may accept or not accept the tender depending on the Procuring Entity's budget considerations.
- ii. If specifications, scope of work and/or conditions of contract are contributory to the abnormally high tender prices, the Procuring Entity shall reject all tenders and may retender for the contract based on revised estimates, specifications, scope of work and conditions of contract, as the case may be.

37.6 If the Procuring Entity determines that the Tender Price is abnormally too high because genuine competition between tenderers is compromised (*often due to collusion, corruption or other manipulations*), the Procuring Entity shall reject all Tenders and shall institute or cause competent Government Agencies to institute an investigation on the cause of the compromise, before retendering.

380 Unbalanced and/ or front-loaded tenders

381 If in the Procuring Entity's opinion, the Tender that is evaluated as the lowest evaluated price is seriously unbalanced and/or frontloaded, the Procuring Entity may require the Tenderer to provide written clarifications. Clarifications may include detailed price analyses to demonstrate the consistency of the tender prices with the scope of works, proposed methodology, schedule and any other requirements of the Tender document.

382 After the evaluation of the information and detailed price analyses presented by the Tenderer, the Procuring Entity may as appropriate:

- a) accept the Tender;
- b) require that the total amount of the Performance Security be increased at the expense of the Tenderer to a level not exceeding a 30% of the Contract Price;
- c) agree on a payment mode that eliminates the inherent risk of the Procuring Entity paying too much for undelivered works;
- d) reject the Tender,

390 Qualifications of the tenderer

391 The Procuring Entity shall determine to its satisfaction whether the eligible Tenderer that is selected as having submitted the lowest evaluated cost and substantially responsive Tender, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

392 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT 17. The determination shall not take into consideration the qualifications of other firms such as the Tenderer's subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Sub-contractors if permitted in the Tender document), or any other firm(s) different from the Tenderer.

393 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in disqualification of the Tender, in which event the Procuring Entity shall proceed to the Tenderer who offers a substantially responsive Tender with the next lowest evaluated price to make a similar determination of that Tenderer's qualifications to perform satisfactorily.

400 Lowest evaluated tender

Having compared the evaluated prices of Tenders, the Procuring Entity shall determine the

Lowest Evaluated Tender. The Lowest Evaluated Tender is the Tender of the Tenderer that meets the Qualification Criteria and whose Tender has been determined to be:

- a) Most responsive to the Tender document; and
- b) the lowest evaluated price.

41.0 Procuring entity's right to accept any tender, and to reject any or all tenders

The Procuring Entity reserves the right to accept or reject any Tender and to annul the Tender process and reject all Tenders at any time prior to Contract Award, without there by incurring any liability to Tenderers. In case of annulment, all Tenders submitted and specifically, Tender securities, shall be promptly returned to the Tenderers.

F. AWARD OF CONTRACT

42.0 Award criteria

The Procuring Entity shall award the Contract to the successful tenderer whose tender has been determined to be the Lowest Evaluated Tender.

43.0 Notice of Intention to Enter into a Contract/Notification of Award

Upon award of the contract and prior to the expiry of the Tender Validity Period the Procuring Entity shall issue a Notification of Intention to Enter into a Contract/Notification of award to all tenderers which shall contain, at a minimum, the following information:

- a) the name and address of the Tenderer submitting the successful tender;
- b) the Contract price of the successful tender;
- c) a statement of the reason(s) the tender of the unsuccessful tenderer to whom the letter is addressed was unsuccessful, unless the price information in (c) above already reveals the reason;
- d) the expiry date of the Standstill Period; and
- e) instruction on how to request a debriefing and/ or submit a complaint during the stand still period;

44.0 Stand still Period

44.1 The Contract shall not be signed earlier than the expiry of a Standstill Period of 14 days to allow any dissatisfied tender to launch a complaint. Where only one Tender is submitted, the Standstill Period shall not apply.

44.2 Where a Standstill Period applies, it shall commence when the Procuring Entity has transmitted to each Tenderer the Notification of Intention to Enter into a Contract with the successful Tenderer.

45.0 Debriefing by The Procuring Entity

45.1 On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract referred to in ITT 43, an unsuccessful tenderer may make a written request to the Procuring Entity for a debriefing on specific issues or concerns regarding their tender. The Procuring Entity shall provide the debriefing within five days of receipt of the request.

45.2 Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending such a debriefing meeting.

46.0 Letter of Award

Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period specified in ITT 44.1, upon addressing a complaint that has been filed with in the Standstill Period, the Procuring Entity shall transmit the Letter of Award to the successful Tenderer. The letter of award shall request the successful tenderer to furnish the Performance Security within 21 days of the date of the letter.

47.0 Signing of Contract

47.1 Upon the expiry of the fourteen days of the Notification of Intention to enter in to contract and upon the parties meeting their respective statutory requirements, the Procuring Entity shall send the successful Tenderer the Contract Agreement.

47.2 Within fourteen (14) days of receipt of the Contract Agreement, the successful Tenderer shall sign, date, and returnit to the ProcuringEntity.

47.3 The written contract shall be entered into within the period specified in the notification of award and before expiry of the tender validity period.

48.0 Performance Security

48.1 Within twenty-one (21) days of the receipt of the Letter of Award from the Procuring Entity, the successful Tenderer shall furnish the Performance Security and, any other documents required in the **TDS**, in accordance with the General Conditions of Contract, subject to ITT 38.2 (b), using the Performance Security and other Forms included in Section X, Contract Forms, or another form acceptable to the Procuring Entity. A foreign institution providing a bank guarantee shall have a correspondent financial institution located in Kenya, unless the Procuring Entity has agreed in writing that a correspondent bank is not required.

48.2 Failure of the successful Tenderer to submit the above-mentioned Performance Security and otherdocuments required in the **TDS** or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the Tenderer offering the next Best Evaluated Tender.

48.3 Performance security shall not be required for contracts estimated to cost less than the amount specified inthe Regulations.

49.0 Publication of Procurement Contract

Within fourteen days after signing the contract, the Procuring Entity shall publish the awarded contract at its notice boards and websites; and on the Website of the Authority. At the minimum, the notice shall contain the following information:

- a) name and address of the Procuring Entity;
- b) name and reference number of the contract being awarded, a summary of its scope and the selection method used;
- c) the name of the successful Tenderer, the final total contract price, the contract duration;
- d) dates of signature, commencement and completion of contract;
- e) names of all Tenderers that submitted Tenders, and their Tender prices as readout at Tender opening.

50.0 Procurement related Complaints and Administrative Review

50.1 The procedures for making Procurement-related Complaints are as specified in the **TDS**.

50.2 A request for administrative review shall be made in the form provided under contract forms.

SECTION II – TENDER DATA SHEET (TDS)

The following specific data shall complement, supplement, or amend the provisions in the Instructions to Tenderers (ITT). Whenever there is a conflict, the provisions herein shall prevail over those in ITT.

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
A. General	
ITT 1.1	The name of the contract is CONSTRUCTION OF THE PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING ON PLOT L.R. NO 28172, KAREN, NAIROBI. The reference number of the Contract is: PJS/012/2021-2022.
ITT 2.4	The Information made available on competing firms is as follows: NONE
ITT 2.4	The firms that provided consulting services for the contract being tendered for are: ARPRIM CONSULTANTS, P.O. BOX 12969-00400, NAIROBI, KENYA.
ITT 3.1	Maximum number of members in the Joint Venture (JV) shall be: TWO
ITT 3.1	(i) The representative of the JV MUST meet Mandatory Requirements; Item no. 2 (Tax Obligations for Tenderers), Item no.11 (Financial Capabilities) and Item no.14 (Specific Construction & Contract Management Experience). (ii) The other JV member MUST individually meet Mandatory Requirements; Item no. 2 (Tax Obligations for Tenderers), and Item no. 16 (Particulars of the Firm). (iii) The Joint Venture MUST collectively meet the Mandatory Requirements criteria as provided in both the; Qualification Form and the Appendix to the Qualification Form.
B. Contents of Tender Document	
ITT 7.1	(i) The Tenderer will submit any request for clarifications in writing at the Address THE DIRECTOR GENERAL, PARLIAMENTARY JOINT SERVICES, 4TH FLOOR, PROTECTION HOUSE, PARLIAMENT ROAD, P.O. BOX 41842 00100, Nairobi, Kenya. Tel: +254 020 2221291 Email: procurementpjs@parliament.go.ke. to reach the Procuring Entity not later than seven (7) days to the date of submission of tenders. (ii) The Procuring Entity shall publish its response at the website(s) www.parliament.go.ke
ITT 7.2	(A) There shall be no pre-arranged pretender site visit: Bidders interested in visiting the site can make arrangement with the procuring entity as specified in ITT 9.1 B) Pre-Tender meeting SHALL take place at the following date, time and place: Date: 26th November, 2021. Time: 11:00a.m. Place: 2nd Floor Boardroom, Protection House, along Parliament Road, Nairobi.

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 7.3	The Tenderer will submit any questions in writing, to reach the Procuring Entity not later than seven (7) days to the date of submission of tenders.
ITT 7.5	The Procuring Entity's website where Minutes of the pre-Tender meeting and the pre-arranged pretender will be published is www.parliament.go.ke . Minutes shall be emailed to those who attend. Bidders are required to provide a valid email address.
ITT 9.1	For Clarification of Tender purposes, for obtaining further information, the Procuring Entity's address is: THE CHIEF PROCUREMENT OFFICER, PARLIAMENTARY JOINT SERVICES, 4th FLOOR, PROTECTION HOUSE, PARLIAMENT ROAD, P.O. BOX 41842 00100, Nairobi, Kenya. Tel: +254 020 2221291 Email: procurementpjs@parliament.go.ke. Website(s): www.parliament.go.ke, www.tenders.go.ke
C. Preparation of Tenders	
ITT 11.1 (h)	The Tenderer shall submit the following additional documents in its Tender: AS PER SECTION III; EVALUATION AND QUALIFICATIONS CRITERIA. All documents submitted by the tenderer should meet the evaluation criteria outlined in Section III of this tender document.
ITT 11.2	As indicated in ITT 3.1
ITT 13.1	Alternative Tenders SHALL NOT be considered.
ITT 13.2	Alternative times for completion SHALL NOT be permitted. Bidders will be required to state the completion time in the form of tender.
ITT 13.4	Alternative technical solutions shall be permitted for the following parts of the Works: SLABS AND BEAMS. Tenderer to provide design calculations, technical specifications, breakdown of prices and proposed construction methodology. THERE SHOULD BE NO COST IMPLICATIONS.
ITT 14.5	The rate quoted by the Tenderer shall not be: SUBJECT TO ADJUSTMENT. Only Fluctuations shall be applicable, 12 Months from the date of Contract Signing. The Fluctuation Indices to be used in price adjustment shall be as per the Kenya National Bureau of Statistics.
ITT 15.2 (a)	Foreign currency requirements not allowed.
ITT 18.1	The Tender validity period shall be 182 days.
ITT 18.3	(a) The Number of days beyond the expiry of the initial tender validity period will be 30 days. (b) The Tender price shall be adjusted by the following percentages of the tender price: (i) By Nil % of the local currency portion of the Contract price adjusted to reflect local inflation during the period of extension, and (ii) By Nil % the foreign currency portion of the Contract price adjusted to reflect the international inflation during the period of extension.
ITT 19.1	Tender shall provide a Tender Security.

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	The type of Tender security shall be a Bank guarantee from a financial institution recognized and/or regulated by the Central Bank of Kenya in the amount of Kenya Shillings Thirty Million (Kshs.30,000,000.00) Only. Valid for 217 days. Payable to Parliamentary Joint Services.
ITT 20.1	In addition to the original of the Tender, the number of copies is: 1 copy clearly marking each “ORIGINAL TENDER” and “COPY OF TENDER,” as appropriate.
ITT 20.3	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of: a written Power of Attorney.
D. Submission and Opening of Tenders	
ITT 22.1	(A) For <u>Tender submission purposes only</u> , the Procuring Entity’s address is: Postal Address: The Director General, Parliamentary Joint Services, Parliament Buildings, Parliament Road, P.O. Box 41842-00100, Nairobi, Kenya. Physical address for hand Courier Delivery to an office or Tender Box at the; Reception on 2nd Floor, Protection House, Parliament Road, Nairobi, Kenya. Date and time for submission of Tenders 17th December, 2021.at 11:00A.M. Tenderers shall not submit tenders electronically.
ITT 25.1	The Tender opening shall take place on 17th December, 2021 at 11: 00A.M at the address for Opening of Tenders provided below: 2nd Floor Boardroom, Protection House, Parliament Road, Nairobi, Kenya.
ITT 25.1	If Tenderers are allowed to submit Tenders electronically, they shall follow the electronic tender submission procedures specified below [<i>insert a description of the electronic Tender opening procedures</i>]: NOT APPLICABLE
ITT 25.9	Tender representative shall sign the register.
E. Evaluation, and Comparison of Tenders	
ITT 30.3	The adjustment shall be based on the Average price of the item or component as quoted in other substantially responsive Tenders. If the price of the item or component cannot be derived from the price of other substantially responsive Tenders, the Procuring Entity shall use its best estimate.
TT 32.1	The currency that shall be used for Tender evaluation and comparison purposes only to convert at the selling exchange rate all Tender prices expressed in various currencies into a single currency is: Kenya Shillings The source of exchange rate shall be: NOT APPLICABLE. The date for the exchange rate shall be: NOT APPLICABLE.

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 33.2	A margin of preference SHALL apply in evaluation.
ITT 33.4	The invitation to tender is extended to the following group that qualify for Reservations NOT APPLICABLE .
ITT 34.1	At this time, the Procuring Entity DOES NOT INTEND to execute certain specific parts of the Works by subcontractors selected in advance.
ITT 34.2	Contractor's may propose subcontracting: Maximum percentage of subcontracting permitted is: 40% of the total contract amount . Tenderers planning to subcontract more than 10% of total volume of work shall specify, in the Form of Tender, the activity (ies) or parts of the Works to be subcontracted along with complete details of the subcontractors and their qualification and experience.
ITT 34.3	<p>The parts of the Works for which the Procuring Entity permits Tenderers to propose Specialized Subcontractors are designated as follows:</p> <ul style="list-style-type: none"> (a) Electrical Installations (b) Plumbing, Drainage and Fire-fighting Installations (c) Lifts Installations (d) Air-conditioning and Mechanical Ventilation Installations <p>For the above-designated parts of the Works that may require Specialized Subcontractors, the relevant qualifications of the proposed Specialized Subcontractors will be added to the qualifications of the Tenderer for the purpose of evaluation.</p>
ITT 35.2 (e)	Additional requirements apply. These are detailed in the evaluation criteria in Section III, Evaluation and Qualification Criteria.
ITT 48.1	<p>Other documents required in addition to the Performance Security are:</p> <ul style="list-style-type: none"> (a) Acceptable Program of works/progress chart (b) Acceptable Insurances (c) The bidder before signing the contract should provide proof of registration with National Construction Authority (NCA) Category 1 (Building works) and an annual contractor's practicing license valid at the time of contract signing.
ITT 50.1	<p>The procedures for making a Procurement-related Complaint are detailed in the "Notice of Intention to Award the Contract" herein and are also available from the PPRA Website www.ppra.go.ke or email complaints@ppra.go.ke.</p> <p>If a Tenderer wishes to make a Procurement-related Complaint, the Tenderer should submit its complaint following these procedures, in writing (by the quickest means available, that is either by hand delivery or email to:</p> <p>The Secretary, Public Procurement Administrative Review Board, 10th Floor, National Bank building, P.O. Box 58583-00200, Nairobi, Kenya.</p> <p>In summary, a Procurement-related Complaint may challenge any of the following (among others):</p> <ul style="list-style-type: none"> (i) the terms of the Tender Documents; and (ii) the Procuring Entity's decision to award the contract.

SECTION III - EVALUATION AND QUALIFICATION CRITERIA

1.0 GENERAL PROVISIONS

- 1.1 This section contains the criteria that the Employer shall use to evaluate tender and qualify tenderers. No other factors, methods or criteria shall be used other than specified in this tender document. The Tenderer shall provide all the information requested in the forms included in Section IV, Tendering Forms. The Procuring Entity shall use **the Standard Tender Evaluation Document for Goods and Works** for evaluating Tenders.
- 1.2 Wherever a Tenderer is required to state a monetary amount, Tenderers should indicate the Kenya Shilling equivalent using the rate of exchange determined as follows:
- a) For construction turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year is to be converted) was originally established.
 - b) Value of single contract - Exchange rate prevailing on the date of the contract signature.
 - c) Exchange rates shall be taken from the publicly available source identified in the ITT 14.3. Any error in determining the exchange rates in the Tender may be corrected by the Procuring Entity.

1.3 EVALUATION AND CONTRACT AWARD CRITERIA

The Procuring Entity shall use the criteria and methodologies listed in this Section to evaluate tenders and arrive at the Lowest Evaluated Tender. The tender that (i) meets the qualification criteria, (ii) has been determined to be substantially responsive to the Tender Documents, and (iii) is determined to have the Lowest Evaluated Tender price shall be selected for award of contract.

2.0 PRELIMINARY EXAMINATION FOR DETERMINATION OF RESPONSIVENESS

Preliminary examination for Determination of Responsiveness

The Procuring Entity will start by examining all tenders to ensure they meet in all respects the eligibility criteria and other mandatory requirements in the ITT, and that the tender is complete in all aspects in meeting the requirements provided for in the preliminary evaluation criteria outlined below. The Standard Tender Evaluation Report Document for Goods and Works for evaluating Tenders provides very clear guide on how to deal with review of these requirements. Tenders that do not pass the Preliminary Examination will be considered non-responsive and will not be considered further.

[The Procuring Entity will provide the preliminary evaluation criteria. To facilitate, a template may be attached or clearly described all information and list of documentation to be submitted by Tenderers to enable preliminary evaluation of the Tender]

3.0 TENDER EVALUATION (ITT 35)

Price evaluation: in addition to the criteria listed in ITT 35.2 (a) – (d) the following criteria shall apply:

- i. Alternative Completion Times, if permitted under ITT 13.2, will be evaluated as follows: **As indicated in the Qualification Form.**
- ii. Alternative Technical Solutions for specified parts of the Works, if permitted under ITT 13.4, will be evaluated as follows: **As per TDS ITT 13.4.**
- iii. Other Criteria; if permitted under ITT 35.2(j): **As indicated in the Qualification Form.**

4.0 MULTIPLE CONTRACTS

- 4.1 Multiple contracts will be permitted in accordance with ITT 35.4. Tenderers are evaluated on basis of Lots and a lowest evaluated tenderer identified for each Lot. The Procuring Entity will select one Option of the two Options listed below for award of Contracts.

OPTION 1

- i. If a tenderer wins only one Lot, the tenderer will be awarded a contract for that Lot, provided the tenderer meets the Eligibility and Qualification Criteria for that Lot.
- ii. If a tenderer wins more than one Lot, the tenderer will be awarded a contract for all won Lots, provided the tenderer meets the aggregate Eligibility and Qualification Criteria for all the won Lots. The tenderer will be awarded only the combinations for which the tenderer qualifies and the others will be considered for award to second lowest the tenderers.

OPTION 2

The Procuring Entity will consider all possible combinations of won Lots [contract(s)] and determine the combination with the lowest evaluated price. Tenders will then be awarded to the Tenderer or Tenderers in the combination provided the tenderer meets the aggregate Eligibility and Qualification Criteria for all the won Lots.

5.0 ALTERNATIVE TENDERS (ITT 13.1)

Alternative Tenders (ITT 13.1)

An alternative if permitted under ITT 3.1, will be evaluated as follows:

The Procuring Entity shall consider Tenders offered for alternatives as specified in Part 2 - Works requirements. Only the technical alternatives, if any, of the Tenderer with the Best Evaluated Tender conforming to the basic technical requirements shall be considered by the Procuring Entity.

6.0 MARGIN OF PREFERENCE

- a) If the TDS so specifies, the Procuring Entity will grant a margin of preference of fifteen percent (15%) to be loaded on evaluated prices of the foreign tenderers, where the percentage of share holding of Kenyan citizens is less than fifty-one percent (51%).
- b) Contractors shall be asked to provide, as part of the data for qualification, such information, including details of ownership, as shall be required to determine whether, according to the classification established by the Procuring Entity, a particular contractor or group of contractors qualifies for a margin of preference.
- c) After Tenders have been received and reviewed by the Procuring Entity, responsive Tenders shall be assessed to ascertain their percentage of shareholding of Kenyan citizens. Responsive tenders shall be classified into the following groups:
 - i. *Group A:* tenders offered by Kenyan Contractors and other Tenderers where Kenyan citizens hold shares of over fifty one percent (51%).
 - ii. *Group B:* tenders offered by foreign Contractors and other Tenderers where Kenyan citizens hold shares of less than fifty one percent (51%).
- d) All evaluated tenders in each group shall, as a first evaluation step, be compared to determine the lowest tender, and the lowest evaluated tender in each group shall be further compared with each

other. If, as a result of this comparison, a tender from Group A is the lowest, it shall be selected for the award of contract. If a tender from Group B is the lowest, an amount equal to the percentage indicated in Item 6.1 of the respective tender price, including unconditional discounts and excluding provisional sums and the cost of day works, if any, shall be added to the evaluated price offered in each tender from Group B. All tenders shall then be compared using new prices with added prices to Group B and the lowest evaluated tender from Group A. If the tender from Group A is still the lowest tender, it shall be selected forward. If not, the lowest evaluated tender from Group B based on the first evaluation price shall be selected.

7.0 Post qualification and Contract ward (ITT 39), more specifically,

- a) In case the tender was subject to post-qualification, the contract shall be awarded to the lowest evaluated tenderer, subject to confirmation of pre-qualification data, if so required.
- b) In case the tender was not subject to post-qualification, the tender that has been determined to be the lowest evaluated tenderer shall be considered for contract award, subject to meeting each of the following conditions.
 - i. The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow of Kenya Shillings [insert amount] _____ . As indicated in the Qualification Form.
 - ii. Minimum average annual construction turnover of Kenya Shillings [insert amount], equivalent calculated as total certified payments received for contracts in progress and/or completed within the last _____ [insert of year] years. As indicated in the Qualification Form.
 - iii. Atleast _____ (insert number) of contract(s) of a similar nature executed within Kenya, or the East African Community or a broad, that have been satisfactorily and substantially completed as a prime contractor, or joint venture member or sub-contractor each of minimum value Kenya shillings _____ equivalent. As indicated in the Qualification Form.
 - iv. Contractor's Representative and Key Personnel, which are specified as As indicated in the Qualification Form
 - v. Contractors key equipment listed on the table “Contractor's Equipment” below and more specifically listed as [specify requirements for each lot as applicable] As indicated in the Qualification Form.
- a) Other conditions depending on their seriousness.
- a) **History of non-performing contracts:**

Tenderer and each member of JV in case the Tenderer is a JV, shall demonstrate that Non-performance of a contract did not occur because of the default of the Tenderer, or the member of a JV in the last ___ (specify years). The required information shall be furnished in the appropriate form. As indicated in the Qualification Form.

b) Pending Litigation

Financial position and prospective long-term profit ability of the Single Tenderer and in the case the Tenderer is a JV, of each member of the JV, shall remain sound according to criteria established with respect to Financial Capability under Paragraph (i) above if all pending litigation will be resolved against the Tenderer. Tenderer shall provide information on pending litigations in the appropriate form.

c) Litigation History

There shall be no consistent history of court/arbitral award decisions against the Tenderer, in the last _____ (*specify years*). All parties to the contract shall furnish the information in the appropriate form about any litigation or arbitration resulting from contracts completed or on going under its execution over the years specified. A consistent history of awards against the Tenderer or any member of a JV may result in rejection of the tender.

As indicated in the Qualification Form.

TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in 4 stages, namely:

1. Stage 1 - Preliminary Evaluation-Mandatory Requirements;

This stage of evaluation shall involve examination of the qualification form criteria (mandatory requirements) as set out in this tender document. Any bidders who do not meet the criteria set out in this stage will be automatically disqualified and not subjected to further evaluation.

2. Stage 2 -Technical Evaluation;

Bidders who qualify at Stage 1 of Evaluation of Mandatory Requirements will be subjected to Technical Evaluation to determine their responsiveness to criteria set out in this tender document. Tenderers who attain 80% and above on the Technical Evaluation will be considered responsive and will therefore be subjected to Financial Evaluation. Due diligence will be conducted at this stage of evaluation.

3. Stage 3 -Financial Evaluation;

Bidders who will be considered responsive at Stage 2- Technical Evaluation will be subjected to further evaluation of their financial bid. This will involve checking of arithmetic errors and completeness of the financial bid. The lowest evaluated and responsive bidder for will be recommended for due diligence.

4. Stage 4 –Due Diligence and Recommendation for Award

The lowest responsive bidder whose financial bid is competitive and consistent will be recommended for award after undertaking due diligence to verify the authenticity and compliance to the conditions of tender.

STAGE 1. PRELIMINARY EVALUATION

MANDATORY REQUIREMENTS

Mandatory Instructions to Tenderers:

- 1. Tenderers must meet all the requirements in the Qualification Form (Mandatory Requirements) items no.MR1-MR22 and SMR1-SMR7 for each of the four subcontractors. Tenderers MUST note that, should ANY of their Sub-Contractors NOT meet any of the Sub-Contractors' Preliminary Criteria the Candidate will be disqualified together with his/her entire team of Sub-Contractors. Failure to meet any of the Mandatory Requirements will lead to automatic disqualification of the bidder.*
- 2. For each of the Mandatory Requirements to qualify, the bidder must meet all the sub-requirements for each of these mandatory requirements.*
- 3. For copies of original documents to be accepted as valid, they MUST be certified by a commissioner of oaths. The Candidate MUST attach a valid practicing license and the active email address of the commissioner of oaths he/she has used to certify the documents.*
- 4. All documents provided may be verified for authenticity. Any document found not to be authentic will lead to automatic disqualification of the Bidder.*

MR1	The “original” and “copy” of tender documents should be properly Tape Bound and paginated in the correct sequence with clear up to date table of content and all pages must be initialed/signed/stamped. NB: Spiral Binding and use of Spring or Box Files will not be allowed and will result in automatic disqualification. Lack of up to date table of content will lead to disqualification. The total number of pages in the submission must be indicated by the bidder on the Cover Page.
MR2	Attach Registration/Incorporation certificate. In case of a joint Venture, all parties must attach Registration/Incorporation certificate;
MR3	In case of a joint Venture, all parties must submit and attach a duly signed joint venture agreement as well as Power of Attorney delegating authority to the signatory of the tender to commit the tenderer and in joint venture, a person from a party to the joint venture should be nominated to commit on behalf of the whole team;
MR4	Bidders shall provide valid tax compliance and PIN certificates. In case of a joint venture all parties must submit a valid tax compliance certificate or its equivalent. In an absence of tax compliance certificate in the country of origin (for foreign companies), then a self-declaration that they are tax compliant must be provided by the Tenderers;
MR5	Financial Capability – the bidder shall provide proof in form of certified and signed audited accounts for three (3) years; 2019,2018 and 2017.with a Minimum annual turnover of Kenya Shillings Seven Billion Five Hundred Million (Kshs.7,500,000,000.00) Only, In the event of a joint venture, only one of the partners shall meet this requirement and submit the certified audited accounts.
MR6	A certified copy of the valid annual practicing certificate of the auditor/auditing firm carrying out the audit in MR5 above. The Contractors MUST provide an active email and telephone number of both the auditor and/or the auditing firm.
MR7	A signed statement that the bidder is not debarred; In case of a joint venture all parties must submit the statement;
MR8	Duly completed confidential business questionnaire; In case of a joint venture all parties must submit a valid confidential business questionnaire;
MR9	Available Cash in hand of Kshs. 270,000,000 or Credit lines of at least Kshs. 700,000,000.00 (attach a letter from a reputable bank and bank statements). In the event of a joint venture, any one of the partners shall meet this requirement and submit the letter from a reputable bank;
MR10	The Tenderer shall demonstrate, to the satisfaction of the Procuring Entity, that it has Cash flow monthly tabulation of at least Kenya Shillings One Hundred Million (Kshs 100,000,000.00) per month for the past six months from the date of closing this tender evidenced by bank statements that must be certified by the issuing bank. The documents so provided may be verified for authenticity. To facilitate the authentication process, applicants must attach letters authorizing their respective

	bank(s) to verify the bank statements when presented to them for verification by the Parliamentary Joint Services.
MR11	Submission of a tender security in the form of a bank guarantee of Ksh. 30,000,000.00 (Thirty Million) valid for a period of 217 days from the date of tender opening payable to Parliamentary Joint Services.
MR12	Submission of valid CR12 form showing the list directors /shareholding (issued within the last 1 year (valid at the date of tender opening) or National Identity Card for Sole Proprietor. In case of a joint Venture, all parties must submit a CR 12;
MR13	Letter of authority to seek references from the Tenderer's bankers;
MR14	Duly filled and signed Anticorruption declaration;
MR15	Dully filled and signed form of tender;
MR16	Details of any previous,current and pending litigation or arbitration proceedings in which the bidder is involved as one of the parties.
MR17	Copy of Current Business / trade permit.
MR18	Evidence that the Company has been operating in Kenya as an ACTIVE building construction works Company for the last ten (10) years from 2010 to 2020, both inclusive. Attach evidence from National Construction Authority, NCA 1 (one) of having been registered to practice as a building engineering works contractor for each of the five years. The tenderer must be able to renew its NCA 1 if recommended for award.
MR19	<p>A minimum number of three (3) comparable contracts in Kenya of a minimum contract sum of Kenya Shillings Two and half Billion (Kshs.2.5 billion) undertaken between 1st January 2010 to date. That Each of the three (3) projects having been satisfactorily and substantially completed. Bidder to provide any three (3) of the following documents:</p> <ul style="list-style-type: none"> • Copies of practical completion certificates, • Certificate of making good defects, • Handing over certificates, • Occupation permits from the relevant local authorities, • Recommendation letter from the Client.
MR20	A minimum number of three (3) comparable contracts undertaken in Kenya between 1 st January 2010 to date, that each of the three (3) projects MUST have a minimum contract sum of Kenya Shillings Three Billion (Kshs.3 billion). Bidders to provide copies of any three (3) of the following documents:

	<ul style="list-style-type: none"> • Construction contract agreements showing project cost • Active contacts (telephone, email, postal address and office location) of the Lead Consultant/Project Manager and the Client for verification of contract amount • Recommendation letter from the client showing contract amount • Signed Final account showing contract amount • Summary page of contract bills of quantities showing contract amount
MR21	A minimum number of three (3) comparable contracts undertaken in Kenya between 1 st January 2010 to date. For each of the projects, bidders to provide active contacts (telephone, email, postal address and office location) of the Lead Consultant/Project Manager and the Client.
MR 22	Foreign and international bidders shall provide a declaration that they shall source at least 40% of their supplies and labour from citizen contractors.

Sub-Contractor Mandatory Evaluation

Tenderers MUST note that, should ANY of their Sub-Contractors NOT meet any of the Sub-Contractors' Preliminary Criteria the Candidate will be disqualified together with his/her entire team of Sub-Contractors.

The Specialized Subcontractors who must meet the outlined requirements SMR-01 to SMR-07 are designated as follows:

- (a) Electrical Installations*
- (b) Plumbing, Drainage and Fire-fighting Installations*
- (c) Lifts Installations*
- (d) Heating, Air-conditioning and Mechanical Ventilation Installations*

	Tenderers to provide qualified and experienced Sub-Contractors who MUST meet the Sub-Contractors' Preliminary Criteria (SMR) as listed below;
SMR1	Provide the Company's Certificate of Incorporation in Kenya from the Registrar of Companies.

SMR2	Provide a valid registration certificate as a specialized works Contractor from the National Construction Authority NCA 1 in the relevant category
SMR3	Provide a valid annual practicing license as a specialized works Contractor from the National Construction Authority.
SMR4	Provide a valid tax compliance certificate.
SMR5	<p>Provide Audited Accounts for the Company for the three (3) years from 2017, 2018, 2019; indicating that the Company has had an annual turnover of Kenya Shillings One Hundred Million (Kshs. 100 Million) and above in each of the three (3) years.</p> <ol style="list-style-type: none"> a. The audited accounts MUST be signed by the auditor preparing the audited accounts and the Sub- Contractors' Company Director(s). b. A certified copy of the professional practicing certificate of the auditor c. A certified copy of the valid annual practicing certificate of the auditor. d. The Sub-Contractors MUST provide an active email and telephone number of both the auditor and the auditing firm. <p>Tenderers with in-house Sub-Contractors to provide their annual audited accounts as given, so as to satisfy this SubContractors' preliminary criteria.</p>
SMR6	Submit a duly filled and signed Confidential Business Questionnaire. For the submitted Confidential Business Questionnaire to qualify, it MUST be in the format provided in this bid document. Changing the format of the Confidential Business Questionnaire shall lead to automatic disqualification of the tenderer.
SMR7	<p>Provide documentary evidence of having undertaken (completed or under construction) at least Two (2no.) building construction works that meet the following criteria:</p> <ol style="list-style-type: none"> (a) Each project submitted MUST be located in Kenya. (b) Each of the two (2) projects having been satisfactorily and substantially completed. Bidder to provide any three (3) of the following documents: <ul style="list-style-type: none"> • copies of practical completion certificates, • certificate of making good defects, • handing over certificates, • occupation permits from the relevant local authorities, • recommendation letter from the Client. (c) Each of the three (3) projects MUST have a minimum contract sum of Kenya Shillings One Hundred Million (Kshs.100 Million). Bidders to provide copies of contract agreements. (d) For each of the projects, bidders to provide active contacts (telephone, email, postal address and office location) of the Lead Consultant/Project Manager and the Client.
SMR8	Copy of Current Business / trade permit.

NOTE: Only Candidates who meet all the requirements of the Mandatory Requirements criteria above will be subjected to Technical Evaluation.

STAGE 2. TECHNICAL EVALUATION CRITERIA FOR THE CANDIDATE

Instructions to Tenderers:

1. *Candidates MUST ensure that ALL the conditions set out in each of the Evaluation Aspects MUST be fully met for the Evaluation Aspect to be awarded marks.*
2. *For copies of documents to be accepted as valid, they MUST be certified by a commissioner of oaths. The Candidate MUST attach a valid practicing license and the active email address of the commissioner of oaths he/she has used to certify the documents.*
3. *Where tenderers provide academic certificates from foreign institutions, certification from the Commissioner of University Education of Kenya MUST be provided for the certificate to qualify.*
4. *All documents provided may be verified for authenticity. Any document found not to be authentic will lead to automatic disqualification of the Bidder.*
5. *Only bidders who score 80% and above at the Technical Evaluation Stage will be subjected to Financial Evaluation.*

Below are the technical evaluation criteria that each Candidate shall be evaluated against:

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Score)
1	General Experience	<p>Tenderer's experience for the last five (5) years – from 2015 up to date</p> <p>Provide evidence that the tenderer has been operating in Kenya as an active building construction works Company for the last five (5) years, from 2015. to date evidenced by building projects undertaken. For any of the years to qualify, the tenderer MUST provide the following:</p> <p>(a) Annual practicing licence from National Construction Authority category 1 (NCA1) of having been registered to practice as a building engineering works contractor for each of the five years.</p> <p>(b) Contractor-Client construction contract agreements for the project under consideration.</p> <p>(c) Active contacts (email, telephone numbers and physical address) of the Client and Lead Consultant/Project Manager's contact person.</p>	Attach all relevant documents to meet this criterion	<p>15 Marks</p> <p><i>Each year that qualifies to score 3 marks to a maximum of 5 years.</i></p>

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Score)
2	A. Key Personnel; Technical	<p>Qualified, relevant technical staff</p> <p>The tenderer to provide at least five (5) qualified and experienced technical staff who will be actively involved in the proposed project. For any of the staff provided to qualify, the following requirements MUST be met:</p> <p>(a) As a minimum, the academic qualifications of each of the staff MUST be a degree from a recognized university in any of the following fields;</p> <ul style="list-style-type: none"> i. Civil and/or Structural Engineering ii. Electrical and/or Mechanical Engineering iii. Quantity Surveying iv. Architecture v. Construction Management vi. Building Technology vii. Any other building construction related field <p>(b) At least three (3) of the staff given MUST be from different fields but within the fields listed above.</p> <p>(c) All the staff provided MUST have as a minimum five years' post university experience in active building construction.</p> <p>(d) Detailed Curriculum Vitae (CV's) of each staff MUST be attached with all relevant certificates. The Curriculum Vitae MUST state qualifications, experience, and duration with the firm. The Curriculum Vitae MUST be signed by the staff (owner of the CV) and a director of the firm. The contacts given in the Curriculum Vitae MUST be an active email address and telephone number of the staff.</p> <p>The staff so provided may be contacted to verify the information given.</p>	Attach all relevant documents to meet this criterion	<p>15 Marks</p> <p><i>Each qualifying technical staff to score 3 marks, to a maximum of 5 staff</i></p>
2	B. Key Personnel; Project Management	<p>Qualified, relevant Management staff</p>	Attach all relevant documents to meet this	6 Marks

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Score)
		<p>The Candidate to provide at least three (3) Qualified Management/Administrative Staff who will be actively involved in the proposed project. For any of the staff provided to qualify, the following qualifications MUST be met;</p> <p>(a) As a minimum, the academic qualifications of each of the staff MUST be a degree from a recognized University in any of the following fields;</p> <ul style="list-style-type: none"> i. Commerce ii. Business Management/ Administration iii. Project Management iv. Construction Management v. Human Resource Management vi. Any other business management /administration related fields <p>(b) All the staff provided MUST have as a minimum five years' post-university experience in active building construction.</p> <p>(c) Detailed Curriculum Vitae (CV's) of each staff MUST be attached with relevant academic certificates. The Curriculum Vitae MUST be signed by the staff (owner of the CV) and a director of the firm. The contacts given in the Curriculum Vitae MUST be an active email address and telephone number of the staff.</p> <p>(d) The Candidate MUST provide a detailed organizational structure of their Company showing the particular positions and responsibilities the staff whose Curriculum Vitae he/she has submitted occupy. They should further indicate which role the staff will play in the proposed project. This information may be verified for authenticity.</p> <p>The staff so provided may be contacted to verify the information given.</p>	criterion	<i>Each qualifying management staff to score 2 marks, to a maximum of 3 staff</i>
2	C. Key Personnel; Company Directors	Qualifications of the Company Directors	Attach all relevant documents to meet this criterion	2 Marks <i>The qualifying</i>

1 Item No.	2 Qualification Subject	3 Qualification Requirement	4 Document To be Completed by Tenderer	5 For Procuring Entity's Use (Score)
		<p>The Candidate to provide evidence that the Company Director(s) have technical qualifications in a construction related field with a minimum Bachelor's degree from a recognized institution.</p> <p>The Curriculum Vitae and copies of academic degree certificates of the Director(s) MUST be attached as evidence of their qualifications.</p> <p>Proof of directorship in the Company MUST be provided in form of a certified copy of the Memorandum and Articles of Association and evidence of appointment as the company director(s) by the shareholders and/or CR12 Certificate issued by the Registrar of Companies (Kenya) within the six (6) months for locally registered companies.</p>		<p><i>director to score 2 marks.</i></p>
3	General Construction Methodology	<p>Candidates to give their general construction methodology which meets the minimum standards in the building industry.</p> <p><i>3 marks to be awarded for each implementation consideration identified which must include a detailed description of how to achieve it to a maximum of 5 key considerations</i></p>	Attach all relevant documents to meet this criterion	15 Marks
4	Construction Methodology specific to the proposed project	<p>Candidates MUST identify key considerations that the Candidate intends to put in place in order to achieve the objectives specific to the proposed project. The methodology MUST describe the techniques, processes and mechanisms that the Candidate will put in place to manage the construction process specific to the proposed project.</p> <p><i>2marks to be awarded for each specific consideration identified which must include a detailed description of how to achieve it to a maximum of 5 key considerations.</i></p>	Attach all relevant documents to meet this criterion	10 Marks
5	Proposed construction period for the project	Candidates MUST submit their proposed construction period for the project which must be accompanied by a works programme and critical path analysis. The proposed works programme and critical path analysis must be practical, realistic and specific to the project.	Attach all relevant documents to meet this criterion	5 Marks

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Score)
		<i>1 mark to be awarded for the construction period, 2 marks for the works programme and 2 marks for the critical path analysis. To be evaluated on its practicality and marks to be prorated amongst Candidates.</i>		
7	Evaluation of the Candidate's financial capability	The Candidate to provide audited accounts for the last three (3) consecutive years from 2017, 2018 and 2019 indicating a current ratio of at least 1.35:1 for each year. <i>Each year with a ratio above 1.35:1 and below 2:1 to be awarded 0.5 mark, each year with a ratio 2:1 and above to be awarded 1 mark.</i>	Forms FIN-3.1, FIN 3.2, FIN 3.3, and FIN 3.4, with all relevant attachments to meet this criterion.	3 Marks
8	Candidate's Insurance Policies.	The Candidate to give certified copies of their current Insurance Policies. These should include any of the following: i. Workers insurance (WIBA) ii. Plant, machinery and equipment insurance iii. Public liability insurance iv. Employer's liability insurance <i>Each Insurance Policy to score 2 mark to a maximum of 2 Policies.</i>	Attach all relevant documents to meet this criterion	4 Marks
9	Registration with relevant Contractor's associations.	Copies of certified documentary evidence of registration with relevant Contractors' Associations in Kenya. <i>Each body to score 0.5 marks to a maximum of 2 bodies</i>	Attach all relevant documents to meet this criterion	1 Marks
10	Candidate's compliance with NSSF and NHIF.	The Candidate to provide copies of certified registration letter and compliance certificate from both NSSF and NHIF. <i>Each certificate/letter to score 0.5 marks to a maximum of 2 marks.</i>	Attach all relevant documents to meet this criterion	2 Marks
11	Candidate's participation in relevant training programs.	The Candidate to provide evidence in form of copies of certified training certificates of undertaking regular staff training programs for capacity building within the construction industry. <i>No training to earn 0-mark, one type of training to earn 1 mark, variety of training programs to earn 2 marks</i>	Attach all relevant documents to meet this criterion	2 Marks

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Score)
12	Evaluation of Sub-Contractors	<p>The following Sub-Contractors will EACH be evaluated: -</p> <ul style="list-style-type: none"> i. Electrical Installations Sub-Contractor ii. Lifts Installations Sub-Contractor iii. Plumbing, Drainage and Fire Fighting Sub-Contractor iv. Air conditioning and Mechanical Ventilation Sub-Contractor <p>Each of the Sub-Contractors listed above to give a detailed report of their previous projects at least two (2) carried out within the past five (5) years-</p> <ul style="list-style-type: none"> a. Construction contract agreements b. Each of the project(s) submitted must be of a cumulative contract sum of over Kenya Shillings One Hundred Million (Kshs. 100 million). <p><i>5 marks for each Sub-Contractor to a maximum of 4 Sub-Contractors.</i></p>	Attach all relevant documents to meet this criterion	20 Marks
		TOTAL SCORE		100 Marks

Only Candidates who attain a minimum score of 80% and above in Technical Evaluation as per the criteria above shall be subjected to Financial Evaluation.

STAGE 3 -FINANCIAL EVALUATION;

Bidders who will be considered responsive at Stage 2- Technical Evaluation will be subjected to further evaluation of their financial bid. This will involve checking of arithmetic errors, consistency of rates and completeness of the financial bid.

STAGE 4 –DUE DILIGENCE AND RECOMMENDATION FOR AWARD

The lowest evaluated bidder whose financial bid is competitive and consistent will be recommended for award after undertaking due diligence to verify the authenticity and compliance to the conditions of tender. The following parameters shall be considered:

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Findings)
1	<p>Due Diligence:</p> <p>A. Visitation of Candidate's project sites of relevant building works.</p>	<p>The evaluation committee shall visit at least two (2) project sites of relevant building works that fall in the two categories listed below:</p> <p>CATEGORY I: One (1) building Project, CURRENTLY UNDER CONSTRUCTION.</p> <p>The project submitted in this category MUST meet the requirements below:</p> <ol style="list-style-type: none"> i. The project MUST be located in Kenya. ii. The project MUST have commenced within the last ten (10) years. iii. The project MUST have a minimum contract sum of Kenya Shillings Three Billion (Kshs.3 Billion). iv. The project MUST have at least one (1) basement level below ground. v. The project MUST have letters of reference from the respective Client and the project Lead Consultant. <p>The project will be evaluated as follows:</p> <ul style="list-style-type: none"> ➤ Construction techniques ➤ Plant, machinery and equipment ➤ Health and safety measures put in place ➤ Management of materials ➤ Labour management ➤ Progress of works ➤ Quality of the works ➤ Quality control measures put in place ➤ General site organization ➤ Environmental measures put in place 	Attach all relevant documents to meet this criterion	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Findings)
		<p>CATEGORY II: One completed and occupied building project.</p> <p>The project submitted in this category MUST meet the requirements below:</p> <ul style="list-style-type: none"> a) The project MUST be located in Kenya. b) The project MUST have commenced within the last ten (10) years. c) The project MUST have a minimum contract sum of Kenya Shillings Three Billion (Kshs.3 Billion). d) The project MUST have at least one (1) basement level below ground. e) The project MUST have letters of reference from the respective Client and the project Lead Consultant. <p>The project will be evaluated as follows:</p> <ul style="list-style-type: none"> ➤ Plumbness, Squareness, Alignment, and Levelness of various building components ➤ Integrity, Quality and standard of materials ➤ Cutting, forming, placing and jointing of materials and components ➤ Meeting the project timelines ➤ Satisfaction of the Client (upon contacting Client) ➤ Satisfaction of the Lead Consultant (upon contacting the Lead Consultant) ➤ Satisfaction of the end user ➤ Aging of the building 	Attach all relevant documents to meet this criterion	
1	B. Visitation of the Candidate's yard/workshops/storage facilities	The evaluation committee will visit the Candidate's construction yard/workshop/storage facility. Documentary proof of ownership or lease of the yard, workshop and storage facilities MUST be provided. The evaluation of the	Attach all relevant documents to meet this criterion	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Findings)
		<p>above will be as follows:</p> <ul style="list-style-type: none"> i. Inspection of the Candidate's yard; adequacy, location ii. Inspection of the Candidate's storage facilities; adequacy, organization and location iii. Inspection of the Candidate's workshop facilities; variety of workshop equipment, capacity 		
1	C. Inspection of the Candidate's construction plant, machinery and equipment	<p>The evaluation committee will visit the Candidate's construction yard or a site where they have kept their construction plant, machinery and equipment.</p> <p>Documentary proof of ownership or lease of the plant, machinery and equipment MUST be provided. The Candidate MUST also attach a letter of commitment that the plant, machinery and equipment will be available for the project if it is awarded to them. The evaluation of the above will be as follows:</p> <ul style="list-style-type: none"> i. Batching plant; adequacy, location ii. Concreting equipment iii. Vertical transportation equipment iv. Vehicular transportation equipment v. Earthmovers/ compactors vi. Power tools/ generator 	Form EQU: Equipment, with all relevant attachments to meet this criterion	
	D. Visitation of the Candidate's office	<p>The evaluation committee shall visit the Candidate's offices. The Candidate MUST state a detailed location of their offices in the Confidential Business Questionnaire as provided in the standard documents. Documentary proof of ownership or lease of the premises MUST be provided.</p> <p>The evaluation committee shall evaluate the following:</p> <ul style="list-style-type: none"> ii. Size of the office; 250m2 and above (1.5 mark), below 250m2 	Confidential Business Questionnaire, with all relevant attachments to meet this criterion	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	<i>Document To be Completed by Tenderer</i>	<i>For Procuring Entity's Use (Findings)</i>
		iii. Office equipment iv. Office furniture v. Office computer software		

SECTION IV - TENDERING FORMS

QUALIFICATION FORMS

1. FOREIGN TENDERERS 40%RULE

Pursuant to ITT 3.9, a foreign tenderer must complete this form to demonstrate that the tender fulfils this condition.

ITEM	Description of Work Item	Describe location of Source	COST in K. shillings	Comments, if any
A	Local Labor			
1				
2				
3				
4				
5				
B	Sub contracts from Local sources			
1				
2				
3				
4				
5				
C	Local materials			
1				
2				
3				
4				
5				
D	Use of Local Plant and Equipment			
1				
2				
3				
4				
5				
E	Add any other items			
1				
2				
3				
4				
5				
6				
	TOTAL COST LOCAL CONTENT		XXXXX	
	PERCENTAGE OF CONTRACT PRICE			

2. FORMEQU: EQUIPMENT

The Tenderer shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Tenderer.

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Tenderer.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

3. FORM PER -1

Contractor's Representative and Key Personnel Schedule

Tenderers should provide the names and details of the suitably qualified Contractor's Representative and Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Contractor' Representative and Key Personnel

1.	Title of position: Contractor's Representative	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
2.	Title of position: [_____]	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
3.	Title of position: [_____]	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
4.	Title of position: [_____]	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
5.	Title of position: <i>[insert title]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>

4. FORM PER - 2:

Resume and Declaration - Contractor's Representative and Key Personnel.

Name of Tenderer		
Position [#1]: <i>[title of position from Form PER-1]</i>		
Personnel information	Name:	Date of birth:
	Address:	E-mail:
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i>	
Details	Address of Procuring Entity:	
	Telephone:	Contact (manager / personnel officer):
	Fax:	
	Job title:	Years with present Procuring Entity:

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

Project	Role	Duration of involvement	Relevant experience
<i>[main project details]</i>	<i>[role and responsibilities on the project]</i>	<i>[time in role]</i>	<i>[describe the experience relevant to this position]</i>

Declaration

I, the undersigned [*insert either "Contractor's Representative" or "Key Personnel" as applicable*], certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Tender:

Commitment	Details
Commitment to duration of contract:	<i>[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]</i>
Time commitment:	<i>[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]</i>

I understand that any misrepresentation or omission in this Form may:

- (a) be taken into consideration during Tender evaluation;
- (b) result in my disqualification from participating in the Tender;
- (c) result in my dismissal from the contract.

Name of Contractor's Representative or Key Personnel: *[insert name]*

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Tenderer:

Signature: _____

Date: (day month year): _____

5. TENDERERS QUALIFICATION WITHOUT PREQUALIFICATION

To establish its qualifications to perform the contract in accordance with Section III, Evaluation and Qualification Criteria the Tenderer shall provide the information requested in the corresponding Information Sheets included hereunder.

5.1 FORM ELI -1.1 Tenderer Information Form

Date: _____ ITT No. and title: _____

Tenderer's name
In case of Joint Venture (JV), name of each member:
Tenderer's actual or intended country of registration: <i>[indicate country of Constitution]</i>
Tenderer's actual or intended year of incorporation:
Tenderer's legal address [in country of registration]:
Tenderer's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of; <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITT 3.6 <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITT 3.5 <input type="checkbox"/> In case of state-owned enterprise or institution, in accordance with ITT 3.8, documents establishing: <ul style="list-style-type: none">• Legal and financial autonomy• Operation under commercial law• Establishing that the Tenderer is not under the supervision of the Procuring Entity
2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

5.2 FORM ELI -1.2

Tenderer's JV Information Form (to be completed for each member of Tenderer's JV)

Date: _____ ITT No. and title: _____

Tenderer's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITT 3.6. <input type="checkbox"/> In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Procuring Entity, in accordance with ITT 3.5.
2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

5.3 FORM CON –2

Historical Contract Non-Performance, Pending Litigation and Litigation History

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> Contract non-performance did not occur since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1.			
<input type="checkbox"/> Contract(s) not performed since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, requirement 2.1			
<input type="checkbox"/> Contract(s) withdrawn since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, requirement 2.1			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and Kenya Shilling equivalent)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Procuring Entity: [insert full name] Address of Procuring Entity: [insert street/city/country] Reason(s) for nonperformance: [indicate main reason(s)]	[insert amount]
Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.			
<input type="checkbox"/> Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.			

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)
		Contract Identification: _____ Name of Procuring Entity: _____ Address of Procuring Entity: _____ Matter in dispute: _____ Party who initiated the dispute: _____ Status of dispute: _____	
		Contract Identification: _____ Name of Procuring Entity: _____ Address of Procuring Entity: _____ Matter in dispute: _____ Party who initiated the dispute: _____ Status of dispute: _____	

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)
Litigation History in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> No Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4. <input type="checkbox"/> Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4 as indicated below.			
<i>[insert year]</i>	<i>[insert percentage]</i>	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Procuring Entity: <i>[insert full name]</i> Address of Procuring Entity: <i>[insert street/city/country]</i> Matter in dispute: <i>[indicate main issues in dispute]</i> Party who initiated the dispute: <i>[indicate "Procuring Entity" or "Contractor"]</i> Reason(s) for Litigation and award decision <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

Include details relating to potential bid-rigging practices such as previous occasions where tenders were withdrawn, joint bids with competitors, subcontracting work to unsuccessful tenderers, etc.

5.4 FORM FIN – 3.1:

Financial Situation and Performance

Tenderer's Name: _____
 Date: _____
 JV Member's Name _____
 ITT No. and title: _____

5.4.1. Financial Data

Type of Financial information in _____ (currency)	Historic information for previous _____ years, _____ (amount in currency, currency, exchange rate*, USD equivalent)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITT 15 for the exchange rate

5.4.2 Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.

No.	Source of finance	Amount (Kenya Shilling equivalent)
1		
2		
3		

5.4.3 Financial documents

The Tenderer and its parties shall provide copies of financial statements for _____ years pursuant Section III, Evaluation and Qualifications Criteria, Sub-factor 3.1. The financial statements shall:

- (a) reflect the financial situation of the Tenderer or in case of JV member, and not an affiliated entity (such as parent company or group member).
- (b) be independently audited or certified in accordance with local legislation.
- (c) be complete, including all notes to the financial statements.
- (d) correspond to accounting periods already completed and audited.

Attached are copies of financial statements¹ for the _____ years required above; and complying with the requirements

¹ If the most recent set of financial statements is for a period earlier than 12 months from the date of Tender, the reason for this should be justified.

5.5 FORM FIN – 3.2:

Average Annual Construction Turnover

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Annual turnover data (construction only)			
Year	Amount Currency	Exchange rate	Kenya Shilling equivalent
<i>[indicate year]</i>	<i>[insert amount and indicate currency]</i>		
Average Annual Construction Turnover *			

* See Section III, Evaluation and Qualification Criteria, Sub-Factor 3.2.

5.6 FORM FIN – 3.3:

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III, Evaluation and Qualification Criteria

Financial Resources		
No.	Source of financing	Amount (Kenya Shilling equivalent)
1		
2		
3		

5.7 FORM FIN – 3.4:

Current Contract Commitments / Works in Progress

Tenderers and each member to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Current Contract Commitments					
No.	Name of Contract	Procuring Entity's Contact Address, Tel,	Value of Outstanding Work [Current Kenya Shilling /month Equivalent]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [Kenya Shilling /month]
1					
2					
3					
4					
5					

5.8 FORM EXP - 4.1

General Construction Experience

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Page _____ of _____ pages

Starting Year	Ending Year	Contract Identification	Role of Tenderer
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Procuring Entity: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Procuring Entity: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Procuring Entity: _____ Address: _____	

5.9 FORM EXP - 4.2(a)

Specific Construction and Contract Management Experience

Tenderer's Name: _____
 Date: _____
 JV Member's Name _____
 ITT No. and title: _____

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount				Kenya Shilling
If member in a JV or sub-contractor, specify participation in total Contract amount				
Procuring Entity's Name:				
Address:				
Telephone/fax number				
E-mail:				

5.9 FORM EXP - 4.2 (a) (cont.)

Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

5.10 FORM EXP - 4.2(b)

Construction Experience in Key Activities

Tenderer's Name: _____
 Date: _____
 Tenderer's JV Member Name: _____
 Sub-contractor's Name² (as per ITT 34): _____
 ITT No. and title: _____

All Sub-contractors for key activities must complete the information in this form as per ITT 34 and Section III, Evaluation and Qualification Criteria, Sub-Factor 4.2.

1. Key Activity No One: _

Information				
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount		Kenya Shilling		
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)		Actual Quantity Performed (i) x (ii)
Year 1				
Year 2				
Year 3				
Year 4				
Procuring Entity's Name:				
Address: Telephone/fax number E-mail:				

² If applicable

	Information
Description of the key activities in accordance with Sub-Factor 4.2(b) of Section III:	

- 2. Activity No. Two
- 3.

OTHER FORMS

6. FORM OF TENDER

INSTRUCTIONS TO TENDERERS

- i) *The Tenderer must prepare this Form of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address.*
- ii) *All italicized text is to help Tenderer in preparing this form.*
- iii) *Tenderer must complete and sign CERTIFICATE OF INDEPENDENT TENDER DETERMINATION and the SELF DECLARATION OF THE TENDERER attached to this Form of Tender.*
- iv) *The Form of Tender shall include the following Forms duly completed and signed by the Tenderer.*
 - *Tenderer's Eligibility- Confidential Business Questionnaire*
 - *Certificate of Independent Tender Determination*
 - *Self-Declaration of the Tenderer*

Date of this Tender submission: *[insert date (as day, month and year) of Tender submission]*

Request for Tender No.: *[insert identification]* **Name and description of Tender**

[Insert as per ITT] **Alternative No.:** *[insert identification No if this is a Tender for an alternative]*

To: *[insert complete name of Procuring Entity]*

Dear Sirs,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct and complete the Works and remedy any defects therein for the sum³ of Kenya Shillings *[Amount in figures]* _____ Kenya Shillings *[amount in words]* _____

The above amount includes foreign currency⁴ amount (s) of *[state figure or a percentage and currency]* *[figures]* _____ *[words]* _____

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Architect notice to commence, and to complete the whole of the Works comprised in the Contract within _____ Weeks *[Insert period in words]*,
_____ Weeks *[Insert period in figures]*.
3. We agree to adhere by this tender until _____ *[Insert date]*, and it shall remain binding upon us and may be accepted at any time before that date.

³ *This sum should be carried forward from the Summary of the Bills of Quantities.*

⁴ *The percentage quoted above should not include provisional sums, and not more than two foreign currencies are allowed.*

4. We understand that you are not bound to accept the lowest or any tender you may receive.
5. We, the under signed, further declare that:
 - i) No reservations: We have examined and have no reservations to the tender document, including Addenda issued in accordance with ITT 28;
 - ii) Eligibility: We meet the eligibility requirements and have no conflict of interest in accordance with ITT 3 and 4;
 - iii) Tender - Securing Declaration: We have not been suspended nor declared ineligible by the Procuring Entity based on execution of a Tender-Securing or Proposal-Securing Declaration in the Procuring Entity's Country in accordance with ITT 19.8;
 - iv) Conformity: We offer to execute in conformity with the tendering documents and in accordance with the implementation and completion specified in the construction schedule, the following Works: *[insert a brief description of the Works]*;
 - v) Tender Price: The total price of our Tender, excluding any discounts offered in item 1 above is: *[Insert one of the options below as appropriate]*
 - vi) Option 1, in case of one lot: Total price is: *[insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies]*; or
Option 2, in case of multiple lots:
 - (a) Total price of each lot *[insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies]*; and
 - (b) Total price of all lots (sum of all lots) *[insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies]*;
 - vii) Discounts: The discounts offered and the methodology for their application are:
 - viii) The discounts offered are: *[Specify in detail each discount offered.]*
 - ix) The exact method of calculations to determine the net price after application of discounts is shown below: *[Specify in detail the method that shall be used to apply the discounts]*;
 - x) Tender Validity Period: Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
 - xi) Performance Security: If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tendering document;
 - xii) One Tender Per Tender: We are not submitting any other Tender(s) as an individual Tender, and we are not participating in any other Tender(s) as a Joint Venture member or as a sub-contractor, and meet the requirements of ITT 3.4, other than alternative Tenders submitted in accordance with ITT 13.3;
 - xiii) Suspension and Debarment: We, along with any of our subcontractors, suppliers, Engineer, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Public Procurement Regulatory Authority or

any other entity of the Government of Kenya, or any international organization.

- xiv) State-owned enterprise or institution: *[select the appropriate option and delete the other] [We are not a state- owned enterprise or institution]/[We are a state-owned enterprise or institution but meet the requirements of ITT3.8];*
- xv) Commissions, gratuities, fees: We have paid, or will pay the following commissions, gratuities, or fees with respect to the tender process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity].*

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate “none.”)

- xvi) Binding Contract: We understand that this Tender, together with your written acceptance there of included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;
- xvii) Not Bound to Accept: We understand that you are not bound to accept the lowest evaluated cost Tender, the Most Advantageous Tender or any other Tender that you may receive;
- xviii) Fraud and Corruption: We here by certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption; and
- xix) Collusive practices: We hereby certify and confirm that the tender is genuine, non-collusive and made with the intention of accepting the contract if awarded. To this effect we have signed the “Certificate of Independent Tender Determination” attached below.
- xx) We undertake to adhere by the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal, copy available from _____ *(specify website)* during the procurement process and the execution of any resulting contract.
- xxi) We, the Tenderer, have completed fully and signed the following Forms as part of our Tender:
 - a) Tenderer's Eligibility; Confidential Business Questionnaire - to establish we are no tin any conflict to interest.
 - (b) Certificate of Independent Tender Determination - to declare that we completed the tender without colluding with other tenderers.
 - (a) Self-Declarationo f the Tenderer - to declare that we will, if awarded a contract, not engage in any form of fraud and corruption.
 - (d) Declaration and commitment to the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal.

Further, we confirm that we have read and understood the full content and scope of fraud and corruption as informed in “**Appendix 1 - Fraud and Corruption**” attached to the Form of Tender.

Name of the Tenderer: **[insert complete name of person signing the Tender]*

Name of the person duly authorized to sign the Tender on behalf of the Tenderer:
***[insert complete name of person duly authorized to sign the Tender]*

Title of the person signing the Tender: *[insert complete title of the person signing the Tender]*

Signature of the person named above: *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* day of *[insert month]*, *[insert year]*

Datesigned _____ dayof _____,

_____ Notes

** In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer.*

***Person signing the Tender shall have the power of attorney given by the Tenderer to be attached with the Tender.*

(a) TENDERER'S ELIGIBILITY-CONFIDENTIAL BUSINESS QUESTIONNAIRE

Instruction to Tenderer

Tender is instructed to complete the particulars required in this Form, *one form for each entity if Tender is a JV*. Tenderer is further reminded that it is an offence to give false information on this Form.

(a) Tenderer's details

	ITEM	DESCRIPTION
1	Name of the Procuring Entity	
2	Reference Number of the Tender	
3	Date and Time of Tender Opening	
4	Name of the Tenderer	
5	Full Address and Contact Details of the Tenderer.	1. Country 2. City 3. Location 4. Building 5. Floor 6. Postal Address 7. Name and email of contact person.
6	Current Trade License Registration Number and Expiring date <i>[attach certified copy]</i>	
7	Name, country and full address (<i>postal and physical addresses, email, and telephone number</i>) of Registering Body/Agency <i>[attach certificate of incorporation/registration]</i>	
8	Description of Nature of Business	
9	Maximum value of business which the Tenderer handles.	
10	State if Tenders Company is listed in stock exchange, give name and full address (<i>postal and physical addresses, email, and telephone number</i>) of state which stock exchange	

General and Specific Details

(b) Sole Proprietor, provide the following details.

Name in full _____ Age _____
Nationality _____ Country of Origin _____
Citizenship _____

[attach certified copy of registration]

(c) **Partnership**, provide the following details.

	Names of Partners	Nationality	Citizenship	% Shares owned
1				
2				
3				

[attach certified copy of registration]

(d) **Registered Company**, provide the following details.

- i) Private or public Company _____
 ii) State the nominal and issued capital of the Company _____

Nominal Kenya Shillings (Equivalent).....

Issued Kenya Shillings (Equivalent).....

- iii) Give details of Directors as follows.

	Names of Director	Nationality	Citizenship	% Shares owned
1				
2				
3				

[attach certified copy of registration]

(e) **DISCLOSURE OF INTEREST - Interest of the Firm in the Procuring Entity.**

[attach certified copy of CR12 or equivalent]

- i) Are there any person/persons in..... (Name of Procuring Entity) who has/have an interest or relationship in this firm? Yes/No.....

If yes, provide details as follows.

	Names of Person	Designation in the Procuring Entity	Interest or Relationship with Tenderer
1			
2			
3			

(i) **Conflict of interest disclosure**

	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
1	Tenderer is directly or indirectly controls, is controlled by or is under common control with another tenderer.		
2	Tenderer receives or has received any direct or indirect subsidy from another tenderer.		
3	Tenderer has the same legal representative as another tenderer		
4	Tender has a relationship with		

	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
	another tenderer, directly or through common third parties, that puts it in a position to influence the tender of another tenderer, or influence the decisions of the Procuring Entity regarding this tendering process.		
5	Any of the Tenderer's affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the tender.		
6	Tenderer would be providing goods, works, non-consulting services or consulting services during implementation of the contract specified in this Tender Document.		
7	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who are directly or indirectly involved in the preparation of the Tender document or specifications of the Contract, and/or the Tender evaluation process of such contract.		
8	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who would be involved in the implementation or supervision of the such Contract.		
9	Has the conflict stemming from such relationship stated in item 7 and 8 above been resolved in a manner acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.		

Certification

On behalf of the Tenderer, I certify that the information given above is complete, current and accurate as at the date of submission.

Full

Name

Title or

Designation

(Signature)

(Date)

b) CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Letter of Tender to the _____ [Name of Procuring Entity] for: _____ [Name and number of tender] in response to the request for tenders made by: _____ [Name of Tenderer] do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of _____ [Name of Tenderer] that:

1. I have read and I understand the contents of this Certificate;
2. I understand that the Tender will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am the authorized representative of the Tenderer with authority to sign this Certificate, and to submit the Tender on behalf of the Tenderer;
4. For the purposes of this Certificate and the Tender, I understand that the word “competitor” shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - a) Has been requested to submit a Tender in response to this request for tenders;
 - b) could potentially submit a tender in response to this request for tenders, based on their qualifications, abilities or experience;
5. The Tenderer discloses that [check one of the following, as applicable]:
 - a) The Tenderer has arrived at the Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor;
 - b) the Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this request for tenders, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements;
6. In particular, without limiting the generality of paragraphs (5)(a) or (5)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a) prices;
 - b) methods, factors or formulas used to calculate prices;
 - c) the intention or decision to submit, or not to submit, a tender; or
 - d) the submission of a tender which does not meet the specifications of the request for Tenders; except as specifically disclosed pursuant to paragraph (5)(b) above;
7. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the works or services to which this request for tenders relates, except as specifically authorized by the procuring authority or as specifically disclosed pursuant to paragraph (5)(b) above;
8. The terms of the Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (5)(b) above.

Name

Title

Date

[Name, title and signature of authorized agent of Tenderer and Date]

(c) **SELF- DECLARATION FORMS**

FORM SD1

SELF DECLARATION THAT THE PERSON/TENDERER IS NOT DEBARRED IN THE MATTER OF THE PUBLIC PROCUREMENT AND ASSET DISPOSAL ACT 2015.

I,, of Post Office Box being a resident of..... in the Republic of do hereby make a statement as follows: -

1. THAT I am the Company Secretary/ Chief Executive/Managing Director/Principal Officer/Direct or of (*insert name of the Company*) who is a Bidder in respect of **Tender No.** for (*insert tender title/description*) for (*insert name of the Procuring entity*) and duly authorized and competent to make this statement.
2. THAT the aforesaid Bidder, its Directors and subcontractors have not been debarred from participating in procurement proceeding under Part IV of the Act.
3. THAT what is deponed to here in above is true to the best of my knowledge, information and belief.

.....
(Title) (Signature) (Date)

Bidder Official Stamp

FORM SD2

SELF DECLARATION THAT THE PERSON/TENDERER WILL NOT ENGAGE IN ANY CORRUPT OR FRAUDULENT PRACTICE.

I,of P.O. Box being a resident of..... in the Republic of do hereby make a statement as follows: -

1. THAT I am the Chief Executive/Managing Director/Principal Officer/Director of (insert name of the Company) who is a Bidder in respect of **Tender No.**..... for..... (*insert tender title/description*) for (*insert name of the Procuring entity*) and duly authorized and competent to make this statement.
2. THAT thefore said Bidder, its servants and/or agents/subcontractors will not engage in any corrupt or fraudulent practice and has not been requested to pay any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (*insert name of the Procuring entity*) which is the procuring entity.
3. THAT the aforesaid Bidder, its servants and/or agents /subcontractors have not offered any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (*name of the procuring entity*).
4. THAT the aforesaid Bidder will not engage /has not engaged in any corrosive practice with other bidders participating in the subject tender
5. THAT what is deponed to here in above is true to the best of my knowledge information and belief.

.....
(Title)

.....
(Signature)

.....
(Date)

Bidder's Official Stamp

DECLARATION AND COMMITMENT TO THE CODE OF ETHICS

I (person) on behalf of (*Name of the Business/ Company/Firm*) declare that I have read and fully understood the contents of the Public Procurement & Asset Disposal Act, 2015, Regulations and the Code of Ethics for persons participating in Public Procurement and Asset Disposal and my responsibilities under the Code.

I do here by commit to abide by the provisions of the Code of Ethics for persons participating in Public Procurement and Asset Disposal.

Name of Authorized signatory.....

Sign.....

Position.....

Office address.....

Telephone.....

E-mail.....

Name of the Firm/Company.....

Date.....

(Company Seal/ Rubber Stamp where applicable)

Witness

Name.....

Sign.....

Date.....

(d) APPENDIX 1 - FRAUD AND CORRUPTION

(Appendix 1 shall not be modified)

1. Purpose

- 1.1 The Government of Kenya's Anti-Corruption and Economic Crime laws and their sanction's policies and procedures, Public Procurement and Asset Disposal Act (*no. 33 of 2015*) and its Regulation, and any other Kenya's Acts or Regulations related to Fraud and Corruption, and similar offences, shall apply with respect to Public Procurement Processes and Contracts that are governed by the laws of Kenya.

2. Requirements

- 2.1 The Government of Kenya requires that all parties including Procuring Entities, Tenderers, (applicants/proposers), Consultants, Contractors and Suppliers; any Sub-contractors, Sub-consultants, Service providers or Suppliers; any Agents (whether declared or not); and any of their Personnel, involved and engaged in procurement under Kenya's Laws and Regulation, observe the highest standard of ethics during the procurement process, selection and contract execution of all contracts, and refrain from Fraud and Corruption and fully comply with Kenya's laws and Regulations as per paragraphs 1.1 above.
- 2.2 Kenya's public procurement and asset disposal act (*no. 33 of 2015*) under Section 66 describes rules to be followed and actions to be taken in dealing with Corrupt, Coercive, Obstructive, Collusive or Fraudulent practices, and Conflicts of Interest in procurement including consequences for offences committed. A few of the provisions noted below highlight Kenya's policy of no tolerance for such practices and behavior:
 - 1) A person to whom this Act applies shall not be involved in any corrupt, coercive, obstructive, collusive or fraudulent practice; or conflicts of interest in any procurement or as set disposal proceeding;
 - 2) A person referred to under subsection (1) who contravenes the provisions of that subsection commits an offence;
 - 3) Without limiting the generality of the subsection (1) and (2), the person shall be: -
 - a) disqualified from entering into a contract for a procurement or asset disposal proceeding; or
 - b) if a contract has already been entered into with the person, the contract shall be voidable;
 - 4) The voiding of a contract by the procuring entity under subsection (7) does not limit any legal remedy the procuring entity may have;
 - 5) An employee or agent of the procuring entity or a member of the Board or committee of the procuring entity who has a conflict of interest with respect to a procurement: -
 - a) Shall not take part in the procurement proceedings;
 - b) shall not, after a procurement contract has been entered in to, take part in any decision relating to the procurement or contract; and
 - c) shall not be a subcontract or for the tender to whom was awarded contract, or a member of the group of tenderers to whom the contract was awarded, but the subcontractor appointed shall meet all the requirements of this Act.

- 6) An employee, agent or member described in subsection (1) who refrains from doing anything prohibited under that subsection, but for that subsection, would have been within his or her duties shall disclose the conflict of interest to the procuring entity;
 - 7) If a person contravenes subsection (1) with respect to a conflict of interest described in subsection (5)(a) and the contract is awarded to the person or his relative or to another person in whom one of them had a direct or indirect pecuniary interest, the contract shall be terminated and all costs incurred by the public entity shall be made good by the awarding officer. Etc.
3. In compliance with Kenya's laws, regulations and policies mentioned above, the Procuring Entity:

- a) Defines broadly, for the purposes of the above provisions, the terms set forth below as follows:
- i) "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
 - ii) "fraudulent practice" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;
 - iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party; "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - iv) "obstructive practice" is:
 - Deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede investigation by Public Procurement Regulatory Authority (PPRA) or any other appropriate authority appointed by Government of Kenya into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
 - acts intended to materially impede the exercise of the PPRA's or the appointed authority's inspection and audit rights provided for under paragraph 2.3 e. below.
- b) Defines more specifically, in accordance with the above procurement Act provisions set forth for fraudulent and collusive practices as follows:
- "fraudulent practice" includes a misrepresentation of fact in order to influence a procurement or disposal process or the exercise of a contract to the detriment of the procuring entity or the tenderer or the contractor, and includes collusive practices amongst tenderers prior to or after tender submission designed to establish tender prices at artificial non-competitive levels and to deprive the procuring entity of the benefits of free and open competition.
- c) Rejects a proposal for award¹ of a contract if PPRA determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
 - d) Pursuant to the Kenya's above stated Acts and Regulations, may recommend to appropriate authority(ies) for sanctioning and debarment of a firm or individual, as applicable under the Acts and Regulations;
 - e) Requires that a clause be included in Tender documents and Request for Proposal documents requiring (i) Tenderers (applicants/proposers), Consultants, Contractors, and Suppliers, and their Sub-contractors, Sub-consultants, Service providers, Suppliers, Agents personnel, permit the PPRA or any other appropriate authority appointed by Government of Kenya to inspect² all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the PPRA or any other appropriate authority appointed by

Government of Kenya; and

- f) Pursuant to Section 62 of the above Act, requires Applicants/Tenderers to submit along with their Applications/Tenders/Proposals a “Self-Declaration Form” as included in the procurement document declaring that they and all parties involved in the procurement process and contract execution have not engaged/will not engage in any corrupt or fraudulent practices.

¹For the avoidance of doubt, a party's eligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and tendering, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

²Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Investigating Authority or persons appointed by the Procuring Entity to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

FORM OF TENDER SECURITY-[Option 1–Demand Bank Guarantee]

Beneficiary: _____

Request for Tenders No: _____

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

1. We have been informed that _____ (here inafter called "the Applicant") has submitted or will submit to the Beneficiary its Tender (here inafter called" the Tender") for the execution of _____ under Request for Tenders No. _____ ("the ITT").
2. Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.
3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:
 - (a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or
 - b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension there to provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance.
4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) thirty days after the end of the Tender Validity Period.
5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above onor before that date.

[signature(s)]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

FORMAT OF TENDER SECURITY [Option 2–Insurance Guarantee] - NOT APPLICABLE

TENDER GUARANTEE No.: _____

1. Whereas [*Name of the tenderer*] (hereinafter called “the tenderer”) has submitted its tender dated [*Date of submission of tender*] for the [*Name and/or description of the tender*] (hereinafter called “the Tender”) for the execution of _____ under Request for Tenders No. _____ (“the ITT”).
2. KNOW ALL PEOPLE by these presents that WE of [**Name of Insurance Company**] having our registered office at (hereinafter called “the Guarantor”), are bound unto [*Name of Procuring Entity*] (hereinafter called “the Procuring Entity”) in the sum of (Currency and guarantee amount) for which payment well and truly to be made to the said Procuring Entity, the Guarantor binds itself, its successors and assigns, jointly and severally, firmly by these presents.

Sealed with the Common Seal of the said Guarantor this ____ day of _____ 20 ____.

3. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Applicant:
 - a) has withdrawn its Tender during the period of Tender validity set forth in the Principal's Letter of Tender (“the Tender Validity Period”), or any extension thereto provided by the Principal; or
 - b) having been notified of the acceptance of its Tender by the Procuring Entity during the Tender Validity Period or any extension thereto provided by the Principal; (i) failed to execute the Contract agreement; or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to tenderers (“ITT”) of the Procuring Entity's Tendering document.

then the guarantee undertakes to immediately pay to the Procuring Entity up to the above amount upon receipt of the Procuring Entity's first written demand, without the Procuring Entity having to substantiate its demand, provided that in its demand the Procuring Entity shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has occurred.

4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) twenty-eight days after the end of the Tender Validity Period.
5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

[Date]

[Signature of the Guarantor]

[Witness]

[Seal]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

TENDER SECURING DECLARATION

[The Bidder shall complete this Form in accordance with the instructions indicated]

Date: *[insert date (as day, month and year) of Tender Submission]*

Tender No.: *[insert number of tendering process]*

To: *[insert complete name of Purchaser]* I/We, the

undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Tender-Securing Declaration.
2. I/We accept that I/we will automatically be suspended from being eligible for tendering in any contract with the Purchaser for the period of time of *[insert number of months or years]* starting on *[insert date]*, if we are in breach of our obligation(s) under the bid conditions, because we—(a) have withdrawn our tender during the period of tender validity specified by us in the Tendering Data Sheet; or (b) having been notified of the acceptance of our Bid by the Purchaser during the period of bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the instructions to tenders.
3. I/We understand that this Tender Securing Declaration shall expire if we are not the successful Tenderer(s), upon the earlier of:
 - a) Our receipt of a copy of your notification of the name of the successful Tenderer; or
 - b) thirty days after the expiration of our Tender.
4. I/We understand that if I am /we are/ in a Joint Venture, the Tender Securing Declaration must be in the name of the Joint Venture that submits the bid, and the Joint Venture has not been legally constituted at the time of bidding, the Tender Securing Declaration shall be in the names of all future partners as named in the letter of intent.

Signed:..... Capacity/title

(director or partner or sole proprietor, etc.)

Name:..... Duly

authorized to sign the bid for and on behalf of: *[insert complete name of Tenderer]*

Dated on day of, *[Insert date of signing]* Seal

orstamp

PART II - WORKS REQUIREMENTS

SECTION V - BILLS OF QUANTITIES

A) Notes and Sample Items for Preparing a Bill of Quantities

1. These Notes for Preparing a Bill of Quantities are intended only as information for the Procuring Entity or the person drafting the Tender Documents. Priced Bills of Quantities shall be part and parcel of the Contract Documents.
2. The objectives and purpose of the Bills of Quantities are to provide sufficient information on the specifications, descriptions and quantities of Works to be performed to enable tenders to be prepared efficiently and accurately and when a contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed. In order to attain these objectives, Works should be itemized in the Bill of Quantities insufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and clear as possible.
3. The Bills of Quantities should be divided generally into the following sections:
 - i. Preambles
 - ii. Preliminary items
 - iii. Work Items
 - iv. Daywork Schedule; and
 - v. Provisional items
 - vi. Summary.

4. NOTES TO PREPARING PREAMBLES

- 41 The Preambles should include only those items that constitute the cost of the works but would not be priced separately as they are expected to be included in the unit prices. Care should be taken to ensure that these items are not a part of the conditions of contract. The Preambles should indicate the inclusiveness of the unit prices and should state the methods of measurement that have been adopted in the preparation of the Bill of Quantities, that are to be used for the measurement of any part of the Works. The units of measurement and abbreviations should be defined and any mandatory national units defined and described. The methods of and procedure for re-measurement should be described in the Preambles.
- 42 Units of Measurement - The following units of measurement and abbreviations shall be used, unless other national units are mandatory in Kenya.

Unit	Abbreviation	Unit	Abbreviation
cubic meter	m ³ or cu m	millimetre	mm
hectare	ha	month	mon
hour	h	number	nr
kilogram	kg	square meter	m ² or sq m
lump sum	ls	square millimeter	mm ² or sq mm
meter	m	week	wk
metric ton	t		

- 43 The Bills of Quantities shall be read in conjunction with the Instructions to Tenders, General and Special Conditions of Contract, Technical Specifications, and Drawings.
- 44 The quantities given in the Bills of Quantities are estimated and partly provisional and are given to provide a common basis for tendering. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Architect and valued at the rates and prices tendered in the priced

Bills of Quantities, where applicable, and otherwise at such rates and prices as the Architect may fix within the terms of the Contract.

- 45 The rates and prices tender in the priced Bills of Quantities shall, except in so far as it is otherwise provided under the Contract, include all Constructional Plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.
- 46 A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
- 47 The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bills of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
- 48 General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bills of Quantities. References to the relevant sections of the Contract documents shall be made before entering prices against each item in the priced Bills of Quantities.
- 49 Provisional Sums and contingency sums included and so designated in the Bills of Quantities shall be expended in whole or in part at the direction and discretion of the Architect in accordance with Sub-Clause 13.5 and Clause 13.6 of the General Conditions of contract.
- 410 In preparing the Bills of Quantities, notes should be removed as they are intended to guide the person preparing the Tender Documents. The Contractor must allow in his rates for any costs associated with and complying with the requirements in the Preambles.
- 411 Should a tenderer/contractor not price any item in any section of the Bills of Quantities including Preliminary items, it will be assumed that he/she has spread its cost in other areas that he/she will have priced. Therefore, the item or items will be executed without any additional costs or without being treated like variations.

5. NOTES ON PREPARING BILLS OF QUANTITIES

- 5.1 The Preliminary Items should be limited to tangible items that should be priced by the tenderer, are identifiable and can be priced separately and included in the interim valuations precisely. Such items may include such items as site office, notice boards, and other temporary works, otherwise items such as security for the Works which are primarily part of the Contractor's obligations should be included in the Contractor's rates.
- 5.2 The work items in the Bills of Quantities should be grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing, or any other special characteristics may give rise to different methods of construction, or phasing of the Works, or considerations of cost. Such groups could be ground excavations, structures, external works, services, etc. General items common to all parts of the Works may be grouped as a separate section in the Bill of Quantities.
- 5.3 Quantities should be computed net from the Drawings, unless directed otherwise in the Contract, and no allowance should be made for bulking, shrinkage or waste. Quantities should be rounded up where appropriate.
- 5.4 Where the measured items are deemed not to be exact because of the likelihood that the scope can change during the execution of the works, such items could be subject to re-measurement, the word "**provisional**" should be used to identify such cases. Where whole sections of the work items fall in this class, for example foundations, they should be labelled "Provisional Quantities" or "Provisional Items" so that the Tenderer/Contractor is advised up front that such items are subject to re-measurement to be done before such work is cover-up.
- 5.5 All items that have not been measured and therefore not subject to tender pricing should be listed in the Bills of Quantities as **Provisional Sums** for particular item or class of Work, which may be subject to a nominated subcontract or separate measurements at a later date during the execution of the works. For example, if it is deemed not possible to measure electrical works before going to tender because detail designs are not ready, a provisional sum can be allowed in the Bills of Quantities for "Installation of Electrical Works" to be executed later when actual design details are completed. To the extent not covered above, there should be in the Bills of Quantities a general provision for physical and financial contingencies made as a "Provisional Sum for

Contingencies” and “Provisional Sum for Fluctuations”. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises.

- 5.6 Provisional sums to cover specialized works normally carried out by Nominated Sub Contractors should be avoided and instead Bills of Quantities of the specialized Works should be included as a section of the main Bills of Quantities to be priced by the Main Contractor. The Main Contractor should be required to indicate the name(s) of the specialized firms he proposes to engage to carry out the specialized Works as his approved domestic sub-contractors. Only provisional sums to cover specialized Works by statutory authorities should be included in the Bills of Quantities.
- 5.7 A Daywork Schedule should be included if the probability of unforeseen work, outside the items included in the Bill of Quantities, is relatively high. To facilitate checking by the Procuring Entity of the realism of rates quoted by the tenderers, the Daywork Schedule should normally comprise:
 - I. A list of the various classes of labor, and materials for which basic.
 - II. Daywork rates and prices for various categories of labor are to be inserted by the tenderer, together with a statement of the conditions under which the Contractor will be paid for Work executed on a Daywork basis.
 - III. A percent a get o be entered by the tenderer agains teach basic Day work item.
 - IV. Subtotal amount for labor, materials and plant representing the Contractor's profit, overheads, supervision and other charges.
- 5.8 The Summary should contain a tabulation of the separate parts of the Bills of Quantities carried forward, with provisional sums for Daywork, Provisional sums and Contingencies, and provision for Total Costing. The last line should allow for tenderer to indicate any discounts before arriving at a total cost carried forward to the Form of Tender.

BILLS OF QUANTITIES

(a) Preambles

1. The method of measurement of completed work for payment shall be in accordance with *[insert the name of a standard reference guide, or full details of the methods to be used]*.
2. The Site is situated in *(provide full description where the site is situated, coordinates from the nearest known landmark like a town and its size)*. It is approximately _____ Kilometers from Nairobi. Access to the site shall be through _____,

Which is an existing public road. Any damage caused to the surfaces of this road shall be made good at the Contractor's expense. The Contractor shall visit the site and acquaint itself with its nature and position, the nature of the ground, substrata and other local conditions, positions of existing power, water and other services, access roads or any other limitations that might affect his cost or progress. No claim for extras shall be considered on account of lack of knowledge in this respect.

- 3 The Contractor shall obtain the Architect's approval on the siting of all temporary buildings, spoil heaps, temporary access path, and storage of materials. The Contractor shall also obtain the Architect approval and direction regarding the use of any materials found on the Site.
- 4 The drawings used in the preparation of these Bills of Quantities can be inspected at the offices of the Procuring Entity or Procuring Entity's Representative during normal working hours. Two sets of the Working Drawings shall be provided to the contractor but additional copies shall be provided at a cost to be determined by the Engineer.
- 5 The Contractor shall allow for the payment of all bank charges in connection with the procurement of Bank Guarantees and stamp charges in connection with this contract Agreement.
- 6 The Contractor shall carry out the various sections of the Works in such an order as the Architect May direct. The Procuring Entity reserves the right to occupy the Works by sections on completion provided that such occupation is considered to be both practical and reasonable and will not interfere with the Works. The Contractor shall allow any costs associated with such occupation.
- 7 The main Contractor will be fully responsible for paying his Sub-Contractor but the Procuring Entity reserves the right in very exceptional circumstances to make such payments direct in the interests of the project where the completion thereof might be jeopardized by any dispute or vicariousness between the Contractor and the Sub- Contractor involve.
- 8 The Contractor shall complete and deliver the Works in the period inserted in the Form of Tender as his time for completion of the Works from the date for Possession, to be agreed with the Engineer. The Contract Period is presumed to have been calculated making due allowance for seasonal inclement weather conditions. No claim for extension of time due to the normal in clement weather for this area shall be entertained.
- 9 The Contractor shall, upon receiving instructions to proceed with the Works, draw up a Programme and Progress Chart setting out the order in which the Works are to be carried out, with the appropriate dates there of. This Chart shall be agreed with the Architect and no deviation from the order set out in it will be permitted without the written consent of the Engineer. The Contractor will be responsible for arranging the above programme with all his sub-Contractors and Specialties. The Contractor shall allow in his rates for carrying out this exercise, and for updating it as required.
- 10 The Contractor shall submit to the Architect on the first day of each week or such longer period as the Architect from time to time direct, a Progress Report and any information for the proceeding period, showing the progress during the period and the up-to-date cumulative progression all important items of each section or portion of the Works.
- 11 The Contractor shall arrange for photographs of the Site to be taken by a professional photographer approved by the Engineer. The Photographs shall provide a record of the Site and adjacent are as prior to the commencement of the Works and shall cover such portion of the works in progress and completion as the Architect shall direct. All prints shall be full plate size, unmounted, and marked on the reverse side with the date of exposure, identification reference and brief description. The copyright of all photographs shall be vested in the Procuring Entity. The negatives and four prints from each negative shall be delivered to the Architect within two weeks of exposure.

- 12 Figured dimensions are to be followed in preference to dimensions scaled from the Drawings, but whenever possible dimensions are to be taken on the Site or from the buildings. Before any work is commenced by Sub-Contractors or Specialist Firms, dimensions must be checked on the site comparable dimensions shown on the drawings. The Contractor shall be responsible for the accuracy of such dimensions.
- 13 Prior to commencement of any work the Contractor is to ascertain from the relevant Authorities the exact position, depth and level of all existing electric cables, waterpipes or other services in the area and he shall make whatever provisions may be required by the Authorities concerned for the support and protection of such services. Any damage or disturbance caused to any services shall be reported immediately to the Architect and the relevant Authority and shall be made good to their satisfaction at the Contractor's expense. Where appropriate the Contractor shall open up the ground in advance of the main work by hand digging if necessary, to locate precisely the position and details of the services which are likely to affect his operations.
- 14 The Contractor shall include in his prices for the transport of materials, workmen, etc./, to and from the site of the proposed works, at such hours and by such route as are permitted by the Authorities.
- 15 The Contractor will be required to make good, at his own expense and damage he may cause to the present road surface and pavements within or beyond the boundary of the Site, during the period of the works. All existing paths, storm water channels, etc., that may be destroyed or damaged during the progress of the Works shall be reinstated by the Contractor to the satisfaction of the Engineer.
- 16 The Contractor is to allow for complying with all instructions and regulations of the Police Authorities.
- 17 All water shall be fresh, clean and pure, free from earthly, vegetable or organic matter, acid or alkaline substance in solution. The Contractor shall provide at his own risk and cost all water for use in connection with the Works, (including works of sub-contractors). If need be, he shall make arrangements with the Local Water Authority for the installation of a separate meter for all water used by him throughout the Contract and pay all cost and fees in connection therewith. He shall also provide temporary storage tanks and tubing, etc., as may be necessary, and clear away at completion.
- 18 The Contractor shall provide all artificial lighting and power for his own use on the Works, (including Sub – Contractor's) including all temporary connections, wiring, fittings, etc., and clearing away on completion. The Contractor shall pay all fees and obtain all permits in connection therewith.
- 19 The Contractor shall constantly keep on the Works a Literate English-speaking Agent or Representative, competent and experienced in the kind of work involved, who shall give his whole time to the superintendence of the works. (Including works of sub – contractors). Such Agent or Representative shall receive on behalf of the Contractor directions and instruction from the Engineer, and such directions and instructions shall be deemed to be given to the contractor in accordance with the Conditions of Contract. The Agent shall not be replaced without the specific approval of the Engineer.
- 20 The Contractor shall ensure that the safety of his work people and all authorized visitors to the site are protected at all times. In particular, there shall be the proper provision of guard-rails to scaffolding, protection against falling materials, tools on site, dust, nail and other sharp objects. The site shall be kept tidy and clear of dangerous rubbish. The Architect shall be empowered to suspend work on site should it be considered this condition is not being observed and no claim arising from such suspension will be allowed.
- 21 The area as available to the Contractor for workyards, offices and other facilities shall be directed by the Architect and any existing features to remain shall be protected from damage throughout the Contract Period and handed back in good condition when they are vacated at the end of the Contract. If additional areas are required, the contractor shall source them at own cost.
- 22 The Contractor shall give the Architect reasonable notice of the intention to set out or take levels for any part of the Works so that arrangements may be made for checking the work. The accuracy of setting out and leveling shall be within the tolerances specified in the Specifications or on the Drawings. The checking of setting out or leveling by the Architect shall not relieve the Contractor of his duties or responsibilities under the Contract.
- 23 The Contractor must take steps necessary to safe guard and shall be held fully responsible for any damage caused to existing and adjacent property, including buildings that are not a subject of demolition. He shall make good at his own cost damage to persons and property caused there on, and he shall indemnify the Procuring Entity against any loss or claim that may arise.

- 24 The Contractor shall take such steps and exercise such care and diligence as to minimize nuisance arising from dust, noise or any other cause to the occupiers of the existing and adjacent property. He must provide such temporary and special screens and tarpaulins or gummy bags, hoarding, barriers, warning signs etc. as he considers necessary and sufficient for the protection of the existing and adjacent property and or prevention of nuisance etc. as directed by Engineer.
- 25 The Contractors attention is drawn to the standards levy order which was amended on 15th October 1998. Legal notice No.154 of 1998. The Contractor is required to pay a monthly level of 0.2% of his factory price of construction works with effect from January 1999. Tenderer shall allow for this in the build-up of his rates.
- 26 The Contractor shall provide temporary sheds, offices meshrooms, sanitary, accommodation and other temporary buildings for the use of the contractor and sub-contractors, including lighting furniture equipment and attendance.
- 27 Contractor shall provide/build labor camp sites to be agreed with the Engineer. Labor camps shall be complete with sanitary accommodation and fencing gates.
- 28 The Contractor must provide the necessary toilet facilities to the requirement and satisfaction of the Health Authorities and maintain the same in a thoroughly clean and sanitary condition and pay all conservancy fees during the period of the Works and remove when no longer required.
- 29 The Contractor shall provide at his own risk and cost all watching and lighting as necessary to safeguard the Works, Plant and materials against damage and theft.
- 30 The Contractor shall provide all necessary hoists, tackle, plant, equipment, vehicles, tools and appliances of every description for the due and satisfactory completion of the Works and shall remove the same on completion. All such plant, tools and equipment shall comply with all regulations in force throughout the period of the Contract and shall be altered or adopted during the Contract period as may be necessary to comply with any amendments in or additions to such regulations.
- 31 Provide, erect and maintain all necessary scaffolding, sufficiently strong and efficient for the due performance of the works, including Sub-Contract Works, provide special scaffolding as required by Sub-Contractors, alter and adopt all scaffolding as and when required during the Works, and remove on completion. No scaffolding is measured here in after and the Contractor must allow in his rates for this.
- 32 The Contractor shall take all necessary precautions such as temporary fencing, hoarding fans, planked footways, guard-rails gantries screen, etc., for the safe custody of the Works, materials and public protection and adjacent properties.
- 33 Cover up all and protect from damage, including damage from inclement weather, all finished work and unfixed materials, including that of Sub-Contractors, etc., to the satisfaction of the Architect until the completion of the Contract.
- 34 The Contractor shall, after completion of the works, at his own expense, remove and clear away all surplus excavated demolition materials, plant, rubbish and unused materials and shall leave the whole of the Site and Works in a clean and tidy state to the satisfaction of the Engineer, sheds, camps, etc. Particular care shall be taken to leave clean all floors and windows and to remove all paint and cement all rubbish and dirt as it accumulates. The Contractor is to find his own dump and shall pay all charges in connection there with.
- 35 Concrete test cubes shall be prepared in a set of three, as described including testing fees, labor and materials, making molds, transport, handling, etc. Allow in your rates for making at least four cubes on each occasion, from different batches; the concrete being taken from the point of deposit.
- 36 The Contractors shall furnish at the earliest possible opportunity before work commences, and at his own cost, any samples of materials and workmanship that may be called for by the Architect for the approval or rejection, and any further samples in the case of rejection, until such samples are approved by the Engineer. Such samples, when approved, shall be the minimum standard for the work to which they apply. The procedure for submitting samples of materials for testing or approval and the method of marking for identification shall be as laid down by the Engineer. The Contractor shall allow in his Tender for such samples and tests, including those in connection with his Sub-Contractors work.
- 37 The Contractors attention is drawn to the Finance Bill of the year 2000/2001 on withholding tax on contractual

payment section 35(7)(i)(ii) which became effective on 1st July 2000. A 3% withholding tax will be applicable to all in term payments exceeding Kshs..... for work done in respect of building or civil works. The contractor shall allow for any costs arising resulting there from in the build-up of rates.

- 38 Blasting will only be allowed with the express permission of the Architect in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost, in accordance with any Government regulations in force for the time being, and any special regulations laid down by the Architect governing the use and storage of explosives.
- 39 The National Construction Authority is a state corporation established under the national construction authority Act No.14 of 2011. The broad Mandate of the Authority is to over see the construction industry and coordinate its development. The National Construction Authority Regulations 2014 with an effective date of 6th June 2014, regulation 25, - Allow 0.5% of the tender sum/contract sum for construction levy.
- 40 The Contractor attention is drawn to Finance Bill of 1993 where VAT was introduced in all contracts for construction services. The tenderer is also drawn to VAT Act Cap 476 clause 19(9). The tenderer must allow for VAT 1.19 as instructed else where.
- 41 The contractor shall allow and pay for all insurance to cover risks and indemnities required Items 17 and 18 of the Conditions of contract and also specified in the Special Conditions of Contract.

BILL NO. 1 - PRELIMINARY ITEMS

ITEM No.	DESCRIPTION	AMOUNT
1.	<p>The Contractor shall provide, or erect and maintain an approved lock-up office for the sole use of the Architect and his own site staff. The office, which will have a total floor area of not less than -----square metres, will be divided into two separate interconnected offices. Services to be provided shall include a telephone, water sanitary and electrical supply and drainage. The offices shall be supplied with furniture and equipment that shall include:</p> <p>4 No. desks with chairs; 1 No. large table with sufficient number of chairs; drawing table along the full length of one side with plan drawers and drawing stools: 4 No. waste paper baskets: sufficient number of pin boards: and any additional furniture and fittings as may reasonably be required during the Contract period. The Contractor shall provide the Architect and site staff with computer sets or laptops, printers and telephones all that are necessary for project use.</p> <p>The office furniture and equipment shall all be to the approval of the Engineer. The Contractor shall also provide all labor, equipment and consumable stores equipment throughout the currency of the contract.</p>	
2	<p>[OPTIONAL] Contractor shall provide a house for Engineers site agent, which shall be one bedroomed temporary house with a sitting room, toilet, bathroom and a kitchen complete with electrical and sanitary installations and provide maintenance and paying of bills of water and electricity up to and including end of the contract period.</p>	
3	<p>Provide a signboard not less than _____ square meters in size of a design type, and with lettering and coloring and in a position approved by the Engineer. The signboard shall be for the display of the Main Contractor's name and the names of all his Sub-Contractors, with the Procuring Entity's name painted thereon. All Consultants names be printed in letters not exceeding 50 mm high. No other signboard or advertising shall be allowed. The signboard shall be fully maintained during the Contract Period and shall be pulled down and removed at the end of the contract.</p>	
4	Add others (if any)	
5		
6		
TOTAL CARRIED TO GRAND SUMMARY		

BILL NO. 2: WORK ITEMS

(organized appropriately into work sections, such as foundations, walls/structure, finishes, doors and windows, mechanical installations. etc.)

Bill No 2 - (Name of Section e.g. Foundations).

<i>Item no.</i>	<i>Description</i>	<i>Unit</i>	<i>Quantity</i>	<i>Rate</i>	<i>Amount</i>
Total for Bill No. 2 (carried forward to Summary, p. ____)					_____

Bill No. 3: Schedule of Daywork Rates - Labor

Item no.	Description	Unit	Nominal quantity	Rate	Amount
	Subtotal				
	Allow ____ percent ^a of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above.				
	Total for Daywork (carried forward to Daywork Summary, p. __)				

a. To be entered by the Tenderer.

Bill No. 4: Schedule of Daywork Rates - Materials

Item no.	Description	Unit	Nominal quantity	Rate	Extended amount
	Subtotal				
	Allow ____ percent a. of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 4 (b) above.				
	Total for Daywork: Materials (carried forward to Daywork Summary, p. _____)				

a. To be entered by the Tenderer.

Bill No. 5: Schedule of Daywork Rates - Contractor's Equipment

<i>Item no.</i>	<i>Description</i>	<i>Nominal quantity (hours)</i>	<i>Basic hourly rental rate</i>	<i>Extended amount</i>
	Allow _ percent ^a of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 5 above.			
Total for Daywork: Contractor's Equipment (carried forward to Daywork Summary, p. __)				

a. To be entered by the Tenderer.

Bill No. 6: Daywork Summary

	<i>Amount^a</i>	<i>% Foreign</i>	<i>Currency</i>
1. Total for Daywork: Labor			
2. Total for Daywork: Materials			
3. Total for Daywork: Contractor's Equipment			
Total for Daywork (Provisional Sum) (carried forward to Summary of Bills of Quantities, p. _____)			

Bill No. 7: Provisional Sums

<i>Bill no.</i>	<i>Item no.</i>	<i>Description</i>	<i>Amount</i>
1			
2			
3			
4			
etc.			
Total for Specified Provisional Sums (carried forward to Grand Summary			

GRAND SUMMARY

SUMMARY ITEMS	<i>Page</i>	<i>Amount</i>
Bill No. 1: Preliminary Items		
Bill No. 2: Work Items		
Bill No 3: Daywork Summary		
Bill No 4: Provisional Sums		
Subtotal of Bills No 1-4		
Allow for any Discounts ⁱ		
TOTAL TENDER PRICE Carried forward to Form of Tender		

(i) If a percentage used, it should be indicated on which Bill No. items but on Bill No.4 – Provisional Sums.

SECTION VI - SPECIFICATIONS

Notes for preparing Specifications

1. Specifications must be drafted to present a clear and precise statement of the required standards of materials, and workmanship for tenderers to respond realistically and competitively to the requirements of the Procuring Entity and ensure responsiveness of tenders. The Specifications should require that all materials, plant, and other supplies to be permanently incorporated in the Works be new, unused, of the most recent or current models, and incorporating all recent improvements in design and materials unless provided otherwise in the Contract. Where the Contractor is responsible for the design of any part of the permanent Works, the extent of his obligations must be stated.
2. Specifications from previous similar projects are useful and may not be necessary to re-write specifications for every Works Contract.
3. There are considerable advantages in standardizing **General Specifications** for repetitive Works in recognized public sectors, such as high ways, urban housing, irrigation and water supply. The General Specifications should cover all classes of workmanship, materials and equipment commonly involved in constructions, although not necessarily to be used in a particular works contract. Deletions or addenda should then adapt the General Specifications to the particular Works.
4. Care must be taken in drafting Specifications to ensure they are not restrictive. In the Specifications of standards for materials, plant and workmanship, existing Kenya Standards should be used as much as possible, otherwise recognized international standards may also be used.
5. The Procuring Entity should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in tender documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential tenderers.
6. The Procuring Entity should provide a description of the selected parts of the Works with appropriate reference to Drawings, Specifications, Bills of Quantities, and Design or Performance criteria, stating that the alternative solutions shall be at least structurally and functionally equivalent to the basic design parameters and Specifications.
7. Such alternative solutions shall be accompanied by all information necessary for a complete evaluation by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, and other relevant details. Technical alternatives permitted in this manner shall be considered by the Procuring Entity each on its own merits and independently of whether the tenderer has priced the item as described in the Procuring Entity's design included with the tender documents.

SECTION VII - DRAWINGS

Note A list of drawings should be inserted here. The actual drawings including Site plans should be annexed in a separate booklet.

**PART III - THE CONDITIONS OF
CONTRACT AND CONTRACT**

SECTION VIII - GENERAL CONDITIONS OF CONTRACT (GCC)

[Name of Procuring Entity]

[Name of Contract]

[Architect Name and Address]

General Conditions of Contract

1. GENERAL PROVISIONS

1.1 Definitions

In this Contract, except where context otherwise requires, the following terms shall be interpreted as indicated below. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

“Accepted Contract Amount” means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

“Base Date” means a date 30 day prior to the submission of tenders.

“Bill of Quantities” means the priced and completed Bill of Quantities forming part of the tender.

“Completion Date” means the date of completion of the Works as certified by the Engineer.

“Contract Price” means the price defined in the contract and there after as adjusted in accordance with the provisions of the Contract.

“Contract” means the agreement entered into between the Procuring Entity and the Contractor as recorded in the Agreement Form and signed by the parties including all attachments and appendices thereto and all documents incorporated by reference therein to execute, complete, and maintain the Works.

“Contractor's Documents” means the calculations, computer programs and other software, progress reports, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.

“Contractor's Equipment” means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor's Equipment excludes Temporary Works, Procuring Entity's Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

“Contractor's Personnel” means the Contractor's Representative and all personnel whom the Contractor utilizes on Site, who may include the staff, labor and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

“Contractor's Representative” means the person named by the Contractor in the Contractor appointed from time to time by the Contractor who acts on behalf of the Contractor.

“Contractor” means the person(s) named as contractor in the Form of Tender accepted by the Procuring Entity.

“Cost” means expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

“Day” means a calendar day and **“year”** means 365 days.

“Dayworks” means Work inputs subject to payment on a time basis for labour and the associated materials and plant.

“Defect” means any part of the Works not completed in accordance with the Contract.

“Defects Liability Certificate” means the certificate issued by Architect upon correction of defects by the Contractor.

“Defects Liability Period” means the period named in the Special Conditions of Contract and calculated from the Completion Date, within which the contractor is liable for any defects that may develop in the handed over works.

“Defects Notification Period” means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], which extends over the days stated in the Special Conditions of Contract.

“Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Procuring Entity in accordance with the Contract.

“Final Payment Certificate” means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].

“Final Statement” means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate].

“Force Majeure” is defined in Clause 19 [Force Majeure].

“Foreign Currency” means a currency of another country (not Kenya) in which part (or all) of the Contract Price is payable, but not the Local Currency.

“Goods” means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

“Interim Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.

“Laws” means all national legislation, statutes, ordinances, and regulations and by-laws of any legally constituted public authority.

“Letter of Acceptance” means the letter of formal acceptance of a tender, signed by Procuring Entity, including any annexed memoranda comprising agreements between and signed by both Parties.

“Local Currency” means the currency of Kenya.

“Materials” means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

“Notice of Dissatisfaction” means the notice given by either Party to the other under Sub-Clause 20.3 indicating its dissatisfaction and intention to commence arbitration.

“Special Conditions of Contract” means the pages completed by the Procuring Entity entitled Special Conditions of Contract which constitute Part A of the Special Conditions.

“Party” means the Procuring Entity or the Contractor, as the context requires.

“Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment].

“Performance Certificate” means the certificate issued under Sub-Clause 11.9 [Performance Certificate].

“Performance Security” means the security (or securities, if any) under Sub-Clause 4.2 [Performance Security].

“Permanent Works” means the permanent works to be executed by the Contractor under the Contract.

“Plant” means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Procuring Entity and relating to the construction or operation of the Works.

“Procuring Entity's Equipment” means the apparatus, machinery and vehicles (if any) made available by the

Procuring Entity for the use of the Contract or in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Procuring Entity.

“Procuring Entity's Personnel” means the Engineer, the Engineer, the assistants and all other staff, labor and other employees of the Architect and of the Procuring Entity; and any other personnel notified to the Contractor, by the Procuring Entity or the Engineer, as Procuring Entity's Personnel.

“Procuring Entity” means the Entity named in the Special Conditions of Contract.

“Engineer” is the person named in the Appendix to Conditions of Contract (or any other competent person appointed by the Procuring Entity and notified to the Contractor, to act in replacement of the Engineer) who is responsible for supervising the execution of the Works and administering the Contract and shall be an “Architect” or a “Quantity Surveyor” registered under the Architects and Quantity Surveyors Act Cap 525 or an “Engineer” registered under Engineers Registration Act Cap 530.

“Engineer” means the person appointed by the Procuring Entity to act as the Architect for the purposes of the Contract and named in the Special Conditions of Contract, or other person appointed from time to time by the Procuring Entity and notified to the Contractor

“Provisional Sum” means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].

“Retention Money” means the accumulated retention moneys which the Procuring Entity retains under Sub-Clause 14.3 [Application for Interim Payment Certificates] and pays under Sub-Clause 14.9 [Payment of Retention Money].

“Schedules” means the document(s) entitled schedules, completed by the Contractor and submitted with the Form of Tender, as included in the Contract.

“Section” means a part of the Works specified in the Special Conditions of Contract as a Section (if any)

“Site Investigation Reports” are those reports that may be included in the tendering documents which a ref actual and interpretative about the surface and sub-surface condition sat the Site.

“Site” means the places where the Permanent Works are to be executed, including storage and working areas, and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

“Specification” means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

“Start Date” or “Commencement Date” is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with the Site possession date(s).

“Statement” means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment], for a payment certificate.

“Subcontractor” means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works.

“Taking-Over Certificate” means a certificate issued under Clause 10 [Procuring Entity's Taking Over].

“Temporary Works” means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

“Temporary works” means works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

“Tender” means the Form of Tender and all other documents which the Contractor submitted with the Form of Tender, as included in the Contract.

“Tests after Completion” means the tests (if any) which are specified in the Contract and which are carried out in

accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Procuring Entity.

“Testson Completion” means the tests which are specified in the Contractor agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Procuring Entity.

“Time for Completion” means the time for completing the Works or a Section (as the case may be) as stated in the Special Conditions of Contract (with any extension calculated from the Commencement Date.

“Unforeseeable” means not reasonably foreseeable by an experienced contractor by the Base Date.

“Variation” means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].

“Works” means the items the Procuring Entity requires the Contractor to undertake as defined in the Appendix to Conditions of Contract. **“Works” may** also mean the Permanent Works and the Temporary Works, or either of them as appropriate.

1.2 Interpretation

In the Contract, except where the context requires otherwise:

- (a) Words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing;
- (d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

1.3 Communications

1.3.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- a) In writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Special Conditions of Contract; and
- b) delivered, sent or transmitted to the address or the recipient's communications as stated in the Special Conditions of Contract. However:
 - I. if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
 - II. if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

1.3.2 Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Architect or the other Party, as the case may be.

1.4 Law and Language

1.4.1 The Contract shall be governed by the laws of **Kenya**.

1.4.2 The ruling language of the Contract shall be **English**.

1.5 Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

- a) The Contract Agreement,
- b) The Letter of Acceptance,
- c) The Special Conditions – Part A,
- d) the Special Conditions – Part B
- e) the General Conditions of Contract
- f) the Form of Tender,
- g) the Specifications and Bills of Quantities
- h) the Drawings, and
- i) the Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Architect shall issue any necessary clarification or instruction.

1.6 Contract Agreement

The Parties shall enter into a Contract Agreement within 14 days after the Contractor receives the Contract Agreement, unless the Special Conditions establish otherwise. The Contract Agreement shall be based upon the form annexed to the Special Conditions. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Procuring Entity.

1.7 Assignment

The Contractor shall not assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, the contractor:

- a) May assign the whole or any part with the prior consent of the Procuring Entity, and
- b) may, as security in favor of a bank or financial institution, assign its right to moneys due, or to become due, under the Contract.

1.8 Care and Supply of Documents

- 1.8.1 The Specifications and Drawings shall be in the custody and care of the Procuring Entity. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawings and Bills of Quantities shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.
- 1.8.2 Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Procuring Entity. Unless otherwise stated in the Contract, the Contractor shall supply to the Architect two copies of each of the Contractor's Documents.
- 1.8.3 The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Procuring Entity's Personnel shall have the right of access to all these documents at all reasonable times.
- 1.8.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.

1.9 Timely provision of Drawings or Instructions

- 1.9.1 The Contractor shall give notice to the Architect whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and the nature and amount of the delay or disruption likely to be suffered if it is late.
- 1.9.2 If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Architect to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- b) payment of any other associated costs accrued, which shall be included in the Contract Price.

1.9.3 After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

1.9.4 However, if and to the extent that the Architect failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, or costs accrued.

1.10 Procuring Entity's Use of Contractor's Documents

1.10.1 As agreed between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

1.10.2 The Contractor shall be deemed (by signing the Contract) to give to the Procuring Entity a non-terminable transferable non-exclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall:

- a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,
- b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and
- c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

1.10.3 The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Procuring Entity for purposes other than those permitted under Sub-Clause 1.10.2.

1.11 Contractor's Use of Procuring Entity's Documents

As agreed between the Parties, the Procuring Entity shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Procuring Entity. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not, without the Procuring Entity's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

1.12 Confidential Details

1.12.1 The Contractor's and the Procuring Entity's Personnel shall ensure confidentiality at all times. The confidentiality shall survive termination or completion of the contract. They shall disclose all such confidential and other information as may be reasonably required in order to verify compliance with the Contract and allow its proper implementation.

1.12.2 The Contractor's and the Procuring Entity's Personnel shall also treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

1.13 Compliance with Laws

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Special Conditions of Contract:

- a) The Procuring Entity shall have obtained (or shall obtain) the planning, zoning, building permit or similar permission for the Permanent Works, and any other permissions described in the Specifications as having been (or to be) obtained by the Procuring Entity; and the Procuring Entity shall indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and

- b) the Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licenses and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Procuring Entity harmless against and from the consequences of any failure to do so, unless the Contractor is impeded to accomplish these actions and shows evidence of its diligence.

1.14 Joint and Several Liability

If the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons:

- a) These persons shall be deemed to be jointly and severally liable to the Procuring Entity for the performance of the Contract;
- b) these persons shall notify the Procuring Entity of their leader who shall have authority to bind the Contractor and each of these persons; and
- c) the Contractor shall not alter its composition or legal status without the prior consent of the Procuring Entity.

1.15 Inspections and Audit by the Procuring Entity

Pursuant to paragraph 2.2(e) of Appendix B to the General Conditions, the Contractor shall permit and shall cause its subcontractors and sub-consultants to permit, the Public Procurement Regulatory Authority, Procuring Entity and/or persons appointed or designated by the Government of Kenya to inspect the Site and/or the accounts and records relating to the procurement process, selection and/or contract execution, and to have such accounts and records audited by auditors appointed by the Procuring Entity if requested by the Procuring Entity. The Contractor's and its Subcontractors' and sub-consultants' attention is drawn to Sub-Clause 15.6 (Fraud and Corruption) which provides, inter alia, that acts intended to materially impede the exercise of the Procuring Entity's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Procuring Entity's prevailing sanctions procedures).

2. THE PROCURING ENTITY

2.1 Right of Access to the Site

- 2.1.1 The Procuring Entity shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated in the **Special Conditions of Contract**. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Procuring Entity is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Procuring Entity shall do so in the time and manner stated in the Specification. However, the Procuring Entity may withhold any such right or possession until the Performance Security has been received.
- 2.1.2 If no such time is stated in the Special Conditions of Contract, the Procuring Entity shall give the Contractor right of access to, and possession of, the Site within such times as required to enable the Contractor to proceed without disruption in accordance with the programme submitted under Sub-Clause 8.3 [Programme].
- 2.1.3 If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Procuring Entity to give any such right or possession within such time, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
 - a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - b) payment of any such Cost-plus profit, which shall be included in the Contract Price.
- 2.1.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.
- 2.1.5 However, if and to the extent that the Procuring Entity's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the

2.2 Permits, Licenses or Approvals

2.21 The Procuring Entity shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain properly:

- a) Copies of the Laws of Kenya which are relevant to the Contract but are not readily available, and
- b) any permits, licenses or approvals required by the Laws of Kenya:
 - i. which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws],
 - ii. for the delivery of Goods, including clearance through customs, and
 - iii. for the export of Contractor's Equipment when it is removed from the Site.

2.3 Procuring Entity's Personnel

The Procuring Entity shall be responsible for ensuring that the Procuring Entity's Personnel and the Procuring Entity's other contractor son the Site:

- a) co-operate with the Contractor's efforts under Sub-Clause 4.6 [Co-operation], and
- b) take action ssimilar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [Safety Procedures] and under Sub-Clause 4.18 [Protection of the Environment].

2.4 Procuring Entity's Financial Arrangements

The Procuring Entity shall make and maintain all necessary financial arrangements which will enable the Procuring Entity to pay the Contract Price punctually (as estimated at that time) in accordance with Clause14 [Contract Price and Payment].

3. THE ENGINEER

3.1 Architect Duties and Authority

- 4.1.1 The Procuring Entity shall appoint the Architect who shall carry out the duties as signed to him in the Contract. The Architect staff shall include suitably qualified Assistants and other professionals who are competent to carry out these duties. The Architect Name and Address shall be provided in the **Special Conditions of Contract**.
- 4.1.2 The Architect shall have no authority to amend the Contract.
- 4.1.3 The Architect May exercise the authority attributable to the Architect as specified in or necessarily to be implied from the Contract. If the Architectis required to obtain the approval of the Procuring Entity before exercising a specified authority, the requirements shall be as stated in the Special Conditions of Contract. The Procuring Entity shall promptly inform the Contractor of any change to the authority attributed to the Engineer.
- 4.1.4 However, whenever the Architect exercises a specified authority for which the Procuring Entity's approvalis required, then (for the purposes of the Contract) the contractor shall require the Architect toprovideevidence of such approval before complying with the instruction.
- 4.1.5 Except as otherwise stated in these Conditions:
 - a) Whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Architect shallbedeemedtoactfortheProcuring Entity;
 - b) the Architect has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract;
 - c) any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Architect (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances; and

- d) anyact by the Architect in response to a Contractor's request shall be notified in writing to the Contractor within 14 days of receipt.

4.1.6 The following provisions shall apply:

The Architect shall obtain the specific approval of the Procuring Entity before taking action under the following Sub-Clauses of these Conditions:

- a) Sub-Clause 4.12: agreeing or determining an extension of time and/or additional cost.
- b) Sub-Clause 13.1: instructing a Variation, except;
 - I. In an emergency situation as determined by the Engineer, or
 - II. If such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the **Special Conditions of Contract**.
- c) Sub-Clause 13.3: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2.
- d) Sub-Clause 13.4: Specifying the amount payable in each of the applicable three currencies.

4.1.7 Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forth with comply, despite the absence of approval of the Procuring Entity, with any such instruction of the Engineer. The Architect shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Procuring Entity.

3.2 Delegation by the Engineer

- 3.2.1 The Architect may from time to time assign duties and delegate authority to assistants and may also revoke such assignment or delegation. These assistants may include a resident Engineer, and/or independent inspectors appointed to inspect and/ or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties. However, unless otherwise agreed by both Parties, the Architect shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [Determinations].
- 3.2.2 Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorized to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:
 - a) Any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Architect to reject the work, Plant or Materials;
 - b) If the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3 Instructions of the Engineer

- 3.3.1 The Architect may issue to the Contractor (at anytime) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under Clause 3.2.1.
- 3.3.2 The Contractor shall comply with the instructions given by the Architect or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Architect or a delegated assistant:
 - a) Gives an oral instruction,
 - b) receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and

- c) does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation,

Then the confirmation shall constitute the written instruction of the Architect or delegated assistant (as the case may be).

3.4 Replacement of the Engineer

If the Procuring Entity intends to replace the Engineer, the Procuring Entity shall, in not less than 21 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended person to replace the Engineer.

3.5 Determinations

- 3.5.1 Whenever these Conditions provide that the Architect shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Architect shall consult with each Party in an endeavor to reach agreement. If agreement is not achieved, the Architect shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.
- 3.5.2 The Architect shall give notice to both Parties of each agreement or determination, with supporting particulars, within 30 days from the receipt of the corresponding claim or request except when otherwise specified. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [Claims, Disputes and Arbitration].

4. THE CONTRACTOR

4.1 Contractor's General Obligations

- 4.1.1 The Contractor shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Architect instructions, and shall remedy any defects in the Works.
- 4.1.2 The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.
- 4.1.3 All equipment, material, and services to be incorporated in or required for the Works shall have their origin in any eligible source country.
- 4.1.4 The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the design or specification of the Permanent Works.
- 4.1.5 The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.
- 4.1.6 If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Special Conditions:
 - a) The Contractor shall submit to the Architect the Contractor's Documents for this part in accordance with the procedures specified in the Contract;
 - b) these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [Law and Language], and shall include additional information required by the Architect to add to the Drawings for co-ordination of each Party's designs;
 - c) the Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and
 - d) prior to the commencement of the Tests on Completion, the Contractor shall submit to the Architect the "as-built" documents and, if applicable, operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Procuring Entity to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections] until these documents and manuals have been submitted to the Engineer.

4.2 Performance Security

- 4.2.1 The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount stated in the **Special Conditions of Contract** and denominated in the currency (ies) of the Contract or in a freely convertible currency acceptable to the Procuring Entity. If an amount is not stated in the Special Conditions of Contract, this Sub-Clause shall not apply.
- 4.2.2 The Contractor shall deliver the Performance Security to the Procuring Entity within 30 days after receiving the Notification of Award and shall send a copy to the Engineer. The Performance Security shall be issued by a reputable bank selected by the Contractor and shall be in the form annexed to the Special Conditions, as stipulated by the Procuring Entity in the Special Conditions of Contract, or in another form approved by the Procuring Entity.
- 4.2.3 The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 30 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.
- 4.2.4 The Procuring Entity shall not make a claim under the Performance Security, except for amounts to which the Procuring Entity is entitled under the Contract.
- 4.2.5 The Procuring Entity shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Procuring Entity was not entitled to make the claim.
- 4.2.6 The Procuring Entity shall return the Performance Security to the Contractor within 14 days after receiving a copy of the Taking-Over Certificate.
- 4.2.7 Without limitation to the provisions of the rest of this Sub-Clause, whenever the Architect determines an addition or a reduction to the Contract Price as a result of a change in cost and/ or legislation, or as a result of a Variation, amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Architect request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.

4.3 Contractor's Representative

- 4.3.1 The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract. The Contractor's Representative's Name and Address shall be provided in the **Special Conditions of Contract**.
- 4.3.2 Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Architect for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked in terms of Sub-Clause 6.9 [Contractor's Personnel], or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of an other suitable person for such appointment.
- 4.3.3 The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.
- 4.3.4 The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Architect prior consent, and the Architect shall be notified accordingly.
- 4.3.5 The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer].
- 4.3.6 The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Architect has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.
- 4.3.7 The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4 [Law and Language]. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make a competent interpreter available during all working hours in a number

deemed sufficient by the Engineer.

4.4 Sub-contractors

- 4.4.1 The Contractor shall not subcontract the whole of the Works. The contractor may however subcontract the works as provided in Clause 34.2.
- 4.4.2 The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if they were acts or defaults of the Contractor. Unless otherwise stated in the Special Conditions:
- a) The Contractor shall not be required to obtain consent to suppliers solely of Materials, or to a subcontract for which the Subcontractor is named in the Contract;
 - b) The prior consent of the Procuring Entity shall be obtained to other proposed Subcontractors;
 - c) the Contractor shall give the Procuring Entity not less than 14 days' notice of the intended date of the commencement of each Subcontractor's work, and of the commencement of such work on the Site; and
 - d) each subcontract shall include provisions which would entitle the Procuring Entity to require the subcontract to be assigned to the Procuring Entity under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [Termination by Procuring Entity].
- 4.4.3 The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [Confidential Details] apply equally to each Subcontractor.
- 4.4.4 Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from Kenya to be appointed as Subcontractors.

4.5 Assignment of Benefit of Subcontract

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Procuring Entity, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Procuring Entity for the work carried out by the Subcontractor after the assignment takes effect.

4.6 Co-operation

- 4.6.1 The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:
- a) The Procuring Entity's Personnel,
 - b) Any other contractors employed by the Procuring Entity, and
 - c) The personnel of any legally constituted public authorities, who may be employed in the execution on or near the Site of any work not included in the Contract.
- 4.6.2 Any such instruction shall constitute a Variation if and to the extent that it causes the Contractor to suffer delays and/or incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.
- 4.6.3 If, under the Contract, the Procuring Entity is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Architect in the time and manner stated in the Specification.

4.7 Setting Out of the Works

- 4.7.1 The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.
- 4.7.2 The Procuring Entity shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used.
- 4.7.3 If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided

this delay and/ or Cost, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- b) payment of any such costs accrued, which shall be included in the Contract Price.

4.7.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this.

4.8 Safety Procedures

The Contractor shall:

- a) Comply with all applicable safety regulations,
- b) Take care for the safety of all persons entitled to be on the Site,
- c) Use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
- d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [Procuring Entity's Taking Over], and
- e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

4.9 Quality Assurance

1.91. The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the Contract. The Architect shall be entitled to audit any aspect of the system.

1.92. Details of all procedures and compliance documents shall be submitted to the Architect or information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor itself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10 Site Data

4.10.1 The Procuring Entity shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Procuring Entity's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Procuring Entity shall similarly make available to the Contractor all such data which come into the Procuring Entity's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

4.10.2 To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

- a) The form and nature of the Site, including sub-surface conditions,
- b) the hydrological and climatic conditions,
- c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,
- d) the Laws, procedures and labour practices of Kenya, and
- e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

4.11 Sufficiency of the Accepted Contract Amount

4.11.1 The Contractor shall be deemed to:

- a) Have satisfied itself as to the correctness and sufficiency of the Accepted Contract Amount, and
- b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [Site Data].

4.11.2 Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

4.12 Unforeseeable Physical Conditions

4.12.1 In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

4.12.2 If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Architect as soon as practicable.

4.12.3 This notice shall describe the physical conditions, so that they can be inspected by the Architect and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Architect may give. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

4.12.4 If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to notice under Sub-Clause 20.1 [Contractor's Claims] to:

- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- b) payment of any such Cost, which shall be included in the Contract Price.

4.12.5 Upon receiving such notice and inspecting and/or investigating these physical conditions, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

4.12.6 However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Architect may also review whether other physical conditions in similar parts of the Works (if any) were more favorable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favorable conditions were encountered, the Architect may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

4.12.7 The Architect shall take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor's interpretation of any such evidence.

4.13 Rights of Way and Facilities

Unless otherwise specified in the Contract the Procuring Entity shall provide effective access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.

4.14 Avoidance of Interference

4.14.1 The Contractor shall not interfere unnecessarily or improperly with:

- a) The convenience of the public, or
- b) The access to and use and occupation of all roads and foot paths, irrespective of whether they are public or in the possession of the Procuring Entity or of others.

4.14.2 The Contractor shall indemnify and hold the Procuring Entity harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15 Access Route

4.15.1 The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site at Base Date. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

4.15.2 Except as otherwise stated in these Conditions:

- a) The Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;
- b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;
- c) the Procuring Entity shall not be responsible for any claims which may arise from the use or otherwise of any access route;
- d) the Procuring Entity does not guarantee the suitability or a availability of particular access routes; and
- e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.

4.16 Transport of Goods

Unless otherwise stated in the Special Conditions:

- a) the Contractor shall give the Architect not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;
- b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and
- c) the Contractor shall indemnify and hold the Procuring Entity harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods and shall negotiate and pay all claims arising from their transport.

4.17 Contractor's Equipment

The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

4.18 Protection of the Environment

4.18.1 The contractor shall comply with the applicable environmental laws, regulations and policies.

4.18.2 The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

4.18.3 The Contractors shall ensure that emissions, surface charges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

4.19 Electricity, Water and Gas

4.19.1 The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require for his construction activities and to the extent defined in the Specifications, for the tests.

4.19.2 The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specifications. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed.

4.19.3 The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Architect in accordance with Sub-Clause 2.5 [Procuring Entity's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Procuring Entity.

4.20 Procuring Entity's Equipment and Free-Issue Materials

4.20.1 The Procuring Entity shall make the Procuring Entity's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:

- a) The Procuring Entity shall be responsible for the Procuring Entity's Equipment, except that
- b) the Contractor shall be responsible for each item of Procuring Entity's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or control of it.

4.20.1 The appropriate quantities and the amounts due (at such stated prices) for the use of Procuring Entity's Equipment shall be agreed or determined by the Architect in accordance with Sub-Clause 2.5 [Procuring Entity's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Procuring Entity.

4.20.2 The Procuring Entity shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Specification. The Procuring Entity shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them and shall promptly give notice to the Architect of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Procuring Entity shall immediately rectify the notified shortage, defect or default.

4.20.3 After this visual inspection, the free-issue materials shall come under the care, custody and control of the Contractor. The Contractor's obligations of inspection, care, custody and control shall not relieve the Procuring Entity of liability for any shortage, defect or default not apparent from a visual inspection.

4.21 Progress Reports

4.21.1 Unless otherwise stated in the Special Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Architect in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

4.21.2 Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works. Each report shall include:

- a) charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),
 - b) photographs showing the status of manufacture and of progress on the Site;
- c) for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
 - I. commencement of manufacture,
 - II. Contractor's inspections,

- III. tests, and
- IV. shipment and arrival at the Site;
 - d) the details described in Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment];
 - e) copies of quality assurance documents, test results and certificates of Materials;
 - f) list of notices given under Sub-Clause 2.5 [Procuring Entity's Claims] and notices given under Sub-Clause 20.1 [Contractor's Claims];
 - g) safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and
 - h) comparison so factual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22 Security of the Site

Unless otherwise stated in the Special Conditions:

- a) The Contractor shall be responsible for keeping unauthorized persons off the Site, and
- b) authorized persons shall be limited to the Contractor's Personnel and the Procuring Entity's Personnel; and to any other personnel notified to the Contractor, by the Procuring Entity or the Engineer, as authorized personnel of the Procuring Entity's other contractors on the Site.

4.23 Contractor's Operations on Site

- 4.23.1 The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Architect as additional working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land.
- 4.23.2 During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.
- 4.23.3 Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfil obligations under the Contract.

4.24 Fossils

- 4.24.1 All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Procuring Entity. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.
- 4.24.2 The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
 - a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - b) payment of any such Cost, which shall be included in the Contract Price.After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

5. NOMINATED SUBCONTRACTORS

5.1 Definition of "nominated Subcontractor"

In this Contract, “nominated Subcontractor” means a Subcontractor:

- a) Who is nominated by the Procuring Entity, or
- b) Contractor has nominated as a Subcontractor subject to Sub-Clause 5.2 [Objection to Notification].

5.2 Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Procuring Entity as soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Procuring Entity agrees in writing to indemnify the Contractor against and from the consequences of the matter:

- a) there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength;
- b) the nominated Subcontractor does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and employees; or
- c) the nominated Subcontractor does not accept to enter into a subcontract which specifies that, for the subcontracted work (including design, if any), the nominated Subcontractor shall:
 - i. undertake to the Contractor such obligations and liabilities as will enable the Contractor to discharge his obligations and liabilities under the Contract;
 - ii. indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfil these liabilities, and
 - iii. be paid only if and when the Contractor has received from the Procuring Entity payments for sums due under the Subcontract referred to under Sub-Clause 5.3 [Payment to nominated Subcontractors].

5.3 Payments to nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts shown on the nominated Subcontractor's invoices approved by the Contractor which the Architect certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with sub-paragraph (b) of Sub-Clause 13.5 [Provisional Sums], except as stated in Sub-Clause 5.4 [Evidence of Payments].

5.4 Evidence of Payments

5.4.1 Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Architect may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

- a) Submits this reasonable evidence to the Engineer, or
- b)
 - i) Satisfies the Architect in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and
 - ii) Submits to the Architect reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement, then the Procuring Entity may (at his sole discretion) pay, directly to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Procuring Entity, the amount which the nominated Subcontractor was directly paid by the Procuring Entity.

6. STAFF AND LABOR

6.1 Engagement of Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within Kenya.

6.2 Rates of Wages and Conditions of Labor

6.2.1 The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those

established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by Procuring Entity's whose trade or industry is similar to that of the Contractor.

- 6.2.2 The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in Kenya in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of Kenya for the time being in force, and the Contractor shall perform such duties in regard to such deductions there of as may be imposed on him by such Laws.

6.3 Persons in the Service of Procuring Entity

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Procuring Entity's Personnel.

6.4 Lab or Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, employment of children, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights. The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.

6.5 Working Hours

Nowork shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the **Special Conditions of Contract**, unless:

- a) Otherwise stated in the Contract,
- b) The Architect gives consent, or
- c) The work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer, provided that work done outside the normal working hours shall be considered and paid for as overtime.

6.6 Facilities for Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities on site for the Contractor's Personnel. The Contractor shall also provide facilities for the Procuring Entity's Personnel as stated in the Specifications. The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.7 Health and Safety

- 6.7.1 The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with loca lhealth authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Procuring Entity's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.
- 6.7.2 The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide what ever is required by this person to exercise this responsibility and authority.
- 6.7.3 The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Architect may reasonably require.
- 6.7.4 The Contractor shall conduct an awareness programme on HIV and other sexually transmitted diseases via an approved service provider and shall undertake such other measures taken to reduce the risk of the transfer of these diseases between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

6.8 Contractor's Superintendence

6.8.1 Throughout the execution of the Works, and as long thereafter as is necessary to fulfil the Contractor's obligations, the Contractor shall provide all necessary super intendence to plan, arrange, direct, manage, inspect and test the work.

6.8.2 Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and Language]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

6.9 Contractor's Personnel

6.9.1 The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Contractors Key personnel shall be named in the Special Conditions of Contract. The Architect may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

- a) Persists in any misconduct or lack of care,
- b) Carries out duties in competently or negligently,
- c) fails to conform with any provisions of the Contract,
- d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment, or
- e) based on reasonable evidence, is determined to have engaged in Fraud and Corruption during the execution of the Works.

6.9.2 If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

6.10 Records of Contractor's Personnel and Equipment

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

6.11 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.

6.12 Foreign Personnel

6.12.1 The Contractor shall not employ foreign personnel unless the contractor demonstrates that there are no Kenyans with the required skills.

6.12.2 The Contractor shall be responsible for the return of any foreign personnel to the place where they were recruited or to their domicile. In the event of the death in Kenya of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

6.13 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

6.14 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

6.15 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of Kenya, onsite, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereof by Contractor's Personnel.

6.16 Prohibition of Forced or Compulsory Labour

The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements.

6.17 Prohibition of Harmful Child Labor

The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where the relevant labour laws of Kenya have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.

6.18 Employment Records of Workers

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment].

6.19 Workers' Organizations

The Contractor shall comply with the relevant labor laws that recognize workers' rights to form and to join workers' organizations of their choosing without interference.

6.20 Non-Discrimination and Equal Opportunity

The Contractor shall base the labour employment on the principle of equal opportunity and fair treatment and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline.

7. PLANT, MATERIALS AND WORKMANSHIP

7.1 Manner of Execution

The Contractor shall carry out the manufacture/assemble of plant, the production and manufacture of Materials, and all other execution of the Works:

- a) In the manner (if any) specified in the Contract,
- b) in a proper workman like and careful manner, in accordance with recognized good practice, and
- c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2 Samples

The Contractor shall submit the following samples of Materials, and relevant information, to the Architect for consent prior to using the Material in or for the Works:

- a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and
- b) additional samples instructed by the Architect as a Variation.

Each sample shall be labeled as to origin and intended use in the Works.

7.3 Inspection

7.3.1 The Procuring Entity's Personnel shall at all reasonable times:

- a) Have full access to all parts of the Site and to all places from which natural Materials are being obtained, and
- b) during production, manufacture and construction (at the Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

7.3.2 The Contractor shall give the Procuring Entity's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

7.3.3 The Contractor shall give notice to the Architect whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Architect shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Architect does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and there after reinstate and make good, all at the Contractor's cost.

7.4 Testing

7.4.1 This Sub-Clause shall apply to all tests specified in the Contract.

7.4.2 Except as otherwise specified in the Contract, the Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labor, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

7.4.3 The Architect may, under Clause 13 [Variations and Adjustments], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

7.4.4 The Architect shall give the Contractor not less than 24 hours' notice of the Architect intention to attend the tests. If the Architect does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer, and the tests shall then be deemed to have been made in the Architect presence.

7.4.5 If the Contractor suffers delay and/ or incurs Cost from complying with these instructions or as a result of a delay for which the Procuring Entity is responsible, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- b) payment of any such Cost-plus profit, which shall be included in the Contract Price.

7.4.6 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

7.4.7 The Contractor shall promptly forward to the Architect duly certified reports of the tests. When the specified tests have been completed, the Architect shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Architect has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5 Rejection

7.5.1 If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Architect may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

7.5.2 If the Architect requires this Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Procuring Entity to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay these costs to the Procuring Entity.

7.6 Remedial Work

7.6.1 Notwithstanding any previous test or certification, the Architect may instruct the Contractor to:

- a) Remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,
- b) remove and re-execute any other work which is not in accordance with the Contract, and
- c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseen event or otherwise.

- 7.6.2 The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under sub-paragraph (c).
- 7.6.3 If the Contractor fails to comply with the instruction, the Procuring Entity shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay to the Procuring Entity all costs arising from this failure.
- 7.6.4 If the contractor repeatedly delivers defective work, the Procuring Entity may consider termination in accordance with Clause 15.

7.7 Ownership of Plant and Materials

Except as otherwise provided in the Contract, each item of Plant and Materials shall become the property of the Procuring Entity at whichever is the earlier of the following times, free from liens and other encumbrances:

- a) When it is incorporated in the Works;
- b) when the Contractor is paid the corresponding value of the Plant and Materials under Sub-Clause 8.10 [Payment for Plant and Materials in Event of Suspension].

7.8 Royalties

Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payments for:

- a) Natural materials obtained from outside the Site, and
- b) The disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal are as within the Site are specified in the Contract.

8 COMMENCEMENT, DELAYS AND SUSPENSION

8.1 Commencement of Works

- 8.1.1 Except as otherwise specified in the Special Conditions of Contract, the Commencement Date shall be the date at which the following precedent condition have all been fulfilled and the Architect notification recording the agreement of both Parties on such fulfilment and instructing to commence the Work is received by the Contractor:
- a) Signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of Kenya;
 - b) except if otherwise specified in the Special Conditions of Contract, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 [Compliance with Laws] as required for the commencement of the Works.
 - c) Receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [Advance Payment] provided that the corresponding bank guarantee has been delivered by the Contractor.
- 8.1.2 If the said Architect instruction is not received by the Contractor within 180 days from his receipt of the Letter of Acceptance, the Contractor shall be entitled to terminate the Contract under Sub-Clause 16.2 [Termination by Contractor].
- 8.1.3 The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date and shall then proceed with the Works with due expedition and without delay.

8.2 Time for Completion

The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

- a) Achieving the passing of the Test on Completion, and
- b) completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections].
- c)

8.3 Programme

- 8.3.1 The Contractor shall submit a detailed time programme to the Architect within 14 days after receiving the notice under Sub-Clause 8.1 [Commencement of Works]. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:
- a) The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing,
 - b) each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),
 - c) the sequence and timing of inspections and tests specified in the Contract, and
 - d) a supporting report which includes:
 - i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and
 - ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.
- 8.3.2 Unless the Engineer, within 14 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Procuring Entity's Personnel shall be entitled to rely upon the programme when planning their activities.
- 8.3.3 The Contractor shall promptly give notice to the Architect of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price or delay the execution of the Works.
- 8.3.4 If, at anytime, the Architect gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contractor to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Architect in accordance with this Sub-Clause.

8.4 Extension of Time for Completion

- 8.4.1 The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 10.1 [Taking Over of the Works and Sections] is or will be delayed by any of the following causes:
- a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [Variation Procedure]) or other substantial change in the quantity of an item of work included in the Contract,
 - b) a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,
 - c) exceptionally adverse climatic conditions,
 - d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or
 - e) any delay, impediment or prevention caused by or attributable to the Procuring Entity, the Procuring Entity's Personnel, or the Procuring Entity's other contractors.
- 8.4.2 If the Contractor considers itself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Architect in accordance with Sub-Clause 20.1 [Contractor's Claims]. When determining each extension of time under Sub-Clause 20.1, the Architect shall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5 Delays Caused by Authorities

If the following conditions apply, namely:

- a) The Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in Kenya,
- b) These authorities delay or disrupt the Contractor's work, and
- c) the delay or disruption was Unforeseeable, then this delay or disruption will be considered as a cause of delay under sub-paragraph (b) of Sub-Clause 8.4 [Extension of Time for Completion].

8.6 Rate of Progress

- 8.6.1 If, at anytime:
- a) Actual progress is too slow to complete within the Time for Completion, and/or
 - b) Progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [Programme], other than as a result of a cause listed in Sub-Clause 8.4 [Extension of Time for Completion], then the Architect may instruct the Contractor to submit, under Sub-Clause 8.3 [Programme], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.
- 8.6.2 Unless the Architect notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Procuring Entity to incur additional costs, the Contractor shall subject to notice under Sub-Clause 2.5 [Procuring Entity's Claims] pay these costs to the Procuring Entity, in addition to delay damages (if any) under Sub-Clause 8.7 below.
- 8.6.3 Additional costs of revised methods including acceleration measures, instructed by the Architect to reduce delays resulting from causes listed under Sub-Clause 8.4 [Extension of Time for Completion] shall be paid by the Procuring Entity, without generating, however, any other additional payment benefit to the Contractor.

8.7 Delay Damages

- 8.7.1 If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion], the Contractor shall subject to notice under Sub-Clause 2.5 [Procuring Entity's Claims] pay delay damages to the Procuring Entity for this default. These delay damages shall be the sum stated in the **Special Conditions of Contract**, which shall be paid for everyday which shall elapse between the relevant Time for Completion and the date stated in the taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Special Conditions of Contract.
- 8.7.2 These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination by Procuring Entity] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

8.8 Suspension of Work

- 8.8.1 The Architect may at anytime instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.
- 8.8.2 The Architect may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clauses 8.9, 8.10 and 8.11 shall not apply.

8.9 Consequences of Suspension

- 8.9.1 If the Contractor suffers delay and/or incurs Cost from complying with the Architect instructions under Sub-Clause 8.8 [Suspension of Work] and/or from resuming the work, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - b) Payment of any such Cost, which shall be included in the Contract Price.
- 8.9.2 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.
- 8.9.3 The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [Suspension of Work].

8.10 Payment for Plant and Materials in Event of Suspension

The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/ or

Materials which have not been delivered to Site, if:

- a) The work on Plant or delivery of Plant and/ or Materials has been suspended for more than 30 days, and
- b) the Contractor has marked the Plant and/or Materials as the Procuring Entity's property in accordance with the Architect instructions.

8.11 Prolonged Suspension

If the suspension under Sub-Clause 8.8 [Suspension of Work] has continued for more than 84 days, the Contractor may request the Architect permission to proceed. If the Architect does not give permission within 30 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [Variations and Adjustments] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [Termination by Contractor].

8.12 Resumption of Work

After the permission or instruction to proceed is given, the Contractor and the Architect shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receiving from the Architect an instruction to this effect under Clause 13 [Variations and Adjustments].

9 TESTS ON COMPLETION

9.1 Contractor's Obligations

- 9.1.1 The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [Testing], after providing the documents in accordance with sub-paragraph (d) of Sub-Clause 4.1 [Contractor's General Obligations].
- 9.1.2 The Contractor shall give to the Architect not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Architect shall instruct.
- 9.1.3 In considering the results of the Tests on Completion, the Architect shall make allowances for the effect of any use of the Works by the Procuring Entity on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certified report of the results of these Tests to the Engineer.

9.2 Delayed Tests

- 9.2.1 If the Tests on Completion are being unduly delayed by the Procuring Entity, Sub-Clause 7.4 [Testing] (fifth paragraph) and/ or Sub-Clause 10.3 [Interference with Tests on Completion] shall be applicable.
- 9.2.2 If the Tests on Completion are being unduly delayed by the Contractor, the Architect may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.
- 9.2.3 If the Contractor fails to carry out the Tests on Completion within the period of 21 days, the Procuring Entity's Personnel may proceed with the Test at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

9.3 Retesting of related works

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [Rejection] shall apply, and the Architect or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

9.4 Failure to Pass Tests on Completion

- 9.4.1 If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [Retesting], the Architect shall be entitled to:

- a) Order further repetition of Tests on Completion under Sub-Clause 9.3; or
- b) if the failure deprives the Procuring Entity of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Procuring Entity shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 1.4 [Failure to Remedy Defects].

10 PROCURING ENTITY'S TAKING OVER

10.1 Taking Over of the Works and Sections

- 10.1.1 Except as stated in Sub-Clause 9.4 [Failure to Pass Tests on Completion], the Works shall be taken over by the Procuring Entity when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [Time for Completion] and except as allowed in sub-paragraph (a) below, and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.
- 10.1.2 The Contractor may apply by notice to the Architect for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.
- 10.1.3 The Architect shall, within 30 days after receiving the Contractor's application:
 - a) Issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or
 - b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under his Sub-Clause.
- 10.1.4 If the Architect fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 30 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

10.2 Taking Over of Parts of the Works

- 10.2.1 The Architect may, at the sole discretion of the Procuring Entity, issue a Taking-Over Certificate for any part of the Permanent Works.
- 10.2.2 The Procuring Entity shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Architect has issued a Taking-Over Certificate for this part. However, if the Procuring Entity does use any part of the Works before the Taking-Over Certificate is issued:
 - a) The part which is used shall be deemed to have been taken over as from the date on which it is used,
 - b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Procuring Entity, and
 - c) if requested by the Contractor, the Architect shall issue a Taking-Over Certificate for this part.
- 10.2.3 After the Architect has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.
- 10.2.4 If the Contractor incurs Cost as a result of the Procuring Entity taking over and/or using a part of the Works, other than such use as is specified in the Contract agreed by the Contractor, the Contractor shall (i) give notice to the Architect and (ii) be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to payment of any such accrued costs, which shall be included in the Contract Price. After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this accrued cost.
- 10.2.5 If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages there after for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these proportions. The provisions of this paragraph shall only apply

to the daily rate of delay damages under Sub-Clause 8.7 [Delay Damages] and shall not affect the maximum amount of these damages.

10.3 Interference with Tests on Completion

- 10.3.1 If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Procuring Entity is responsible, the Procuring Entity shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.
- 10.3.2 The Architect shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Architect shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.
- 10.3.3 If the Contractor suffers delay and/or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - b) payment of any such accrued costs, which shall be included in the Contract Price.
- 10.3.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

10.4 Surfaces Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

11 DEFECTS LIABILITY

11.1 Completion of Outstanding Work and Remedying Defects

- 11.1.1 In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fairwear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable there after, the Contractor shall:
- a) complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer, and
 - b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Procuring Entity on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).
- 11.1.2 If a defect appears or damage occurs, the Contractor shall be notified accordingly by the Engineer.

11.2 Cost of Remedying Defects

- 11.2.1 All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:
- a) Any design for which the Contractor is responsible,
 - b) Plant, Materials or workmanship not being in accordance with the Contract, or
 - c) Failure by the Contractor to comply with any other obligation.
- 11.2.2 If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Procuring Entity, and Sub-Clause 13.3 [Variation Procedure] shall apply.

11.3 Extension of Defects Notification Period

- 11.3.1 The Procuring Entity shall be entitled subject to Sub-Clause 2.5 [Procuring Entity's Claims] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they

are intended by reason of a defect or by reason of damage attributable to the Contractor. However, a Defects Notification Period shall not be extended by more than two years.

- 11.3.2 If delivery and/ or erection of Plant and/ or Materials was suspended under Sub-Clause 8.8 [Suspension of Work] or Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/ or Materials would otherwise have expired.

11.4 Failure to Remedy Defects

- 11.4.1 If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by the Engineer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.
- 11.4.2 If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Procuring Entity may (at his option):
- a) Carry out the work itself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay to the Procuring Entity the costs reasonably incurred by the Procuring Entity in remedying the defect or damage;
 - b) Require the Architect to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [Determinations]; or
 - c) if the defect or damage deprives the Procuring Entity of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract otherwise, the Procuring Entity shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5 Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the Site and the Procuring Entity gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6 Further Tests

- 11.6.1 If the work of remedying of any defect or damage may affect the performance of the Works, the Architect may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 14 days after the defect or damage is remedied.
- 11.6.2 These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [Cost of Remedying Defects], for the cost of the remedial work.

11.7 Right of Access

Until the Completion Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Procuring Entity's reasonable security restrictions.

11.8 Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defect on parts of the works that have already accepted, under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Cost of the search plus profit shall be agreed or determined by the Architect in accordance with Sub-Clause 3.5 [Determinations] and shall be included in the Contract Price.

11.9 Completion Certificate

- 11.9.1 Performance of the Contractor's obligations shall not be considered to have been completed until the Architect

has issued the Completion Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.

11.9.2 The Architect shall issue the Completion Certificate within 30 days after the latest of the expiry dates of the Defects Liability Period, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Completion Certificate shall be issued to the Procuring Entity.

11.9.3 Only the Completion Certificate shall be deemed to constitute acceptance of the Works.

11.10 Unfulfilled Obligations

After the Completion Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

11.11 Clearance of Site

11.11.1 Upon receiving the Completion Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.

11.11.2 If all these items have not been removed within 30 days after receipt by the Contractor of the Completion Certificate, the Procuring Entity may sell or otherwise dispose of any remaining items. The Procuring Entity shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

11.11.3 Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Procuring Entity's costs, the Contractor shall pay the outstanding balance to the Procuring Entity.

12 MEASUREMENT AND DEVALUATION

12.1 Works to be Measured

12.1.1 The Works shall be measured, and valued for payment, in accordance with this Clause. The Contractor shall show in each application under Sub-Clauses 14.3 [Application for Interim Payment Certificates], 14.10 [Statement on Completion] and 14.11 [Application for Final Payment Certificate] the quantities and other particulars detailing the amounts which he considers to be entitled under the Contract.

12.1.2 Whenever the Architect requires any part of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:

- a) promptly either attend or send another qualified representative to assist the Architect in making the measurement, and
- b) supply any particulars requested by the Engineer.

12.1.3 If the Contractor fails to attend or send a representative, the measurement made by the Architect shall be accepted as accurate.

12.1.4 Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records, these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree her records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.

12.1.5 If the Contractor examines and disagrees the records, and/ or does not sign them as agreed, then the Contractor shall give notice to the Architect of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Architect shall review the records and either confirm or vary them and certify the payment of the undisputed part. If the Contractor does not so give notice to the Architect within 14 days after being requested to examine the records, they shall be accepted as accurate.

12.2 Method of Measurement

Except as otherwise stated in the Contract:

- a) Measurement shall be made of the net actual quantity of each item of the Permanent Works, and
- b) the method of measurement shall be in accordance with the Bill of Quantities or other applicable Schedules.

12.3 Evaluation

- 12.3.1 Except as otherwise stated in the Contract, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of work one by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 and 12.2 and the appropriate rate or price for the item.
- 12.3.2 For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Contractor, if there is no such item, specified for similar work.
- 12.3.3 Any item of work included in the Bill of Quantities for which no rate or price was specified shall be considered as included in other rates and prices in the Bill of Quantities and will not be paid for separately.
- 12.3.4 However, for a new item of work, a new rate or price shall be appropriate for such item of work if:
- The work is instructed under Clause 13 [Variations and Adjustments],
 - no rate or price is specified in the Contract for this item, and
 - no specified rate or price is appropriate because the item of work is not of similar character, or is not executed under similar conditions, as any item in the Contract.
- 12.3.5 Each new rate or price shall be derived from any relevant rates or prices in the Contract. If no rates or prices are relevant for the new item of work, it shall be derived from the reasonable Cost of executing such work, prevailing market rates, together with profit, taking account of any other relevant matters.
- 12.3.6 Until such time as an appropriate rate or price is agreed or determined, the Architect shall determine a provisional rate or price for the purposes of Interim Payment Certificates as soon as the concerned work commences.
- 12.3.7 Where the contract price is different from the corrected tender price, in order to ensure the contractor is not paid less or more relative to the contract price (*which would be the tender price*), payment valuation certificates and variation orders on omissions and additions valued based on rates in the Bill of Quantities or schedule of rates in the Tender, will be adjusted by a plus or minus percentage. The percentage already worked out during tender evaluation is worked out as follows: $(\text{corrected tender price} - \text{tender price}) / \text{tender price} \times 100$.

12.4 Omissions

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

- The Contractor will incur (or has incurred) cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount;
- The omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and
- this cost is not deemed to be included in the evaluation of any substituted work; then the Contractor shall give notice to the Architect accordingly, with supporting particulars. Upon receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this cost, which shall be included in the Contract Price.

13 VARIATIONS AND ADJUSTMENTS

13.1 Right to Vary

- 13.1.1 Variations may be initiated by the Architect at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal. No Variation instructed by the Architect under this Clause shall in any way vitiate or invalidate the Contract.
- 13.1.2 The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Architect stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, or (ii) such Variation triggers a substantial change in the sequence or progress of the Works. Upon receiving this notice, the Architect shall cancel, confirm or vary the instruction.
- 13.1.3 Each Variation may include:
- changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation),
 - changes to the quality and other characteristics of any item of work,
 - changes to the levels, positions and/ or dimensions of any part of the Works,

- d) omission of any work unless it is to be carried out by others,
- e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, or
- f) changes to the sequence or timing of the execution of the Works.

13.1.4 The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Architect instructs after obtaining approval of the Procuring Entity.

13.2 Variation Order Procedure

13.2.1 Prior to any Variation Order under Sub-Clause 13.1.4 the Architect shall notify the Contractor of the nature and form of such variation. As soon as possible after having received such notice, the Contractor shall submit to the Engineer:

- a) A description of work, if any, to be performed and a programme for its execution, and
- b) the Contractor's proposals for any necessary modifications to the Programme according to Sub-Clause 8.3 or to any of the Contractor's obligations under the Contract, and
- c) the Contractor's proposals for adjustment to the Contract Price.

Following the receipt of the Contractor's submission the Architect shall, after due consultation with the Employer and the Contractor, decide as soon as possible whether or not the variation shall be carried out. If the Architect decides that the variation shall be carried out, he shall issue a Variation Order clearly identified as such in accordance with the Contractor's submission or as modified by agreement.

If the Architect and the Contractor are unable to agree the adjustment of the Contract Price, the provisions of Sub-Clause 13.2.2 shall apply.

13.2.2 Disagreement on Adjustment of the Contract Price

If the Contractor and the Architecture unable to agree on the adjustment of the Contract Price, the adjustment shall be determined in accordance with the rates specified in the Bills of Quantities or Schedule of Daywork Prices. If the rates contained in the Bills of Quantities or Dayworks Prices are not directly applicable to the specific work in question, suitable rates shall be established by the Architect reflecting the level of pricing in the Dayworks Prices. Where rates are not contained in the said Prices, the amount shall be such as is in all the circumstances reasonable, reflecting a market price. Due account shall be taken of any over-or under-recovery of overheads by the Contractor in consequence of the variation. The Contractor shall also be entitled to be paid:

- a) The cost of any partial execution of the Work rendered useless by any such variation,
- b) The cost of making necessary alterations to Plant already manufactured or in the course of manufacture or of any work done that has to be altered in consequence of such a variation,
- c) any additional costs incurred by the Contractor by the disruption of the progress of the Works as detailed in the Programme, and
- d) the net effect of the Contractor's finance costs, including interest, caused by the variation.

The Architect shall on this basis determine the rates or prices to enable on-account payment to be included in certificates of payment.

13.2.3 Contractor to Proceed

On receipt of a Variation Order, the Contractor shall forth with proceed to carry out the variation and be bound to these Conditions in so doing as if such variation was stated in the Contract. The work shall not be delayed pending the granting of an extension of the Time for Completion or an adjustment to the Contract Price under Sub-Clause 31.3.

13.3 Value Engineering

13.3.1 The Contractor may, at anytime, submit to the Architect written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Procuring Entity of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Procuring Entity of the completed Works, or

(iv) otherwise be of benefit to the Procuring Entity.

13.3.2 The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [Variation Procedure].

- 13.3.3 If a proposal, which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:
- a) The Contractor shall design this part,
 - b) sub-paragraphs (a) to (d) of Sub-Clause 4.1 [Contractor's General Obligations] shall apply, and
 - c) if this change results in a reduction in the contract value of this part, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:
 - I. such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.8 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost], and
 - II. the reduction (if any) in the value to the Procuring Entity of the varied works, taking account of any improvement in quality, anticipated life or operational efficiencies.

13.3.4 However, if the amount established in item 13.2.3 (c) (i) is less than amount established in item 13.2.3 (c) (ii), there shall not be a fee. However, if the if the amount established in item 13.2.3 (c) (i) is more than amount established in item 13.2.3 (c) (ii), it shall result in a price variation to the Procuring Entity.

13.4 Variation Procedure for Value Engineering proposal

- 13.4.1 If the Architect requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:
- a) A description of the proposed work to be performed and a programme for its execution,
 - b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [Programme] and to the Time for Completion, and
 - c) the Contractor's proposal for evaluation of the Variation.

13.4.2 The Architect shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [Value Project Engineering] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

13.4.3 Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Architect to the Contractor, who shall acknowledge receipt.

13.4.4 Each Variation shall be evaluated in accordance with Clause 12 [Measurement and Evaluation], unless the Architect instructs or approves otherwise in accordance with this Clause.

13.5 Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency, then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

13.6 Provisional Sums

13.6.1 Each Provisional Sum shall only be used, in whole or in part, in accordance with the Architect instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Architect shall have instructed. For each Provisional Sum, the Architect May instruct:

- a) Work to be executed (including Plant, Materials or services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [Variation Procedure]; and/or
- b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]) or otherwise; and for which there shall be included in the Contract Price:
 - i. The actual amounts paid (or due to be paid) by the Contractor, and
 - ii. a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in **the Special Conditions of Contract** shall be applied.

13.6.2 The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or

receipts in substantiation.

13.7 Dayworks

- 13.7.1 For work of a minor or incidental nature, the Architect may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause shall not apply.
- 13.7.2 Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.
- 13.7.3 Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall deliver each day to the Architect accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:
- a) The names, occupations and time of Contractor's Personnel,
 - b) the identification, type and time of Contractor's Equipment and Temporary Works, and
 - c) the quantities and types of Plant and Materials used.
- 13.7.4 One copy of each statement will, if correct, or when agreed, be signed by the Architect and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [Application for Interim Payment Certificates].

13.8 Adjustments for Changes in Legislation

- 13.8.1 The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of Kenya (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.
- 13.8.2 If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes in the Laws or in such interpretations, made after the Base Date, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - b) payment of any such Cost, which shall be included in the Contract Price.
- 13.8.3 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.
- 13.8.4 Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8 [Adjustments for Changes in Cost].

13.9 Adjustments for Changes in Cost

- 13.9.1 In this Sub-Clause, "table of adjustment data" means the completed table of adjustment data for local and foreign currencies included in the Schedules. If there is no such table of adjustment data, this Sub-Clause shall not apply.
- 13.9.2 If this Sub-Clause applies, the amounts payable to the Contractor shall be adjusted for rises or falls in the cost of labor, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.
- 13.9.3 The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

Price Adjustment Formula

Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC**. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type specified below applies:

$$P = A + B \frac{I_m}{I_o}$$

where:

P is the adjustment factor for the portion of the Contract Price payable.

A and **B** are coefficients **specified in the SCC**, representing then on adjustable and adjustable portions, respectively, of the Contract Price payable and

I_m is the index prevailing at the end of the month being invoiced and **I_o** is the index prevailing 30 days before Bid opening for inputs payable.

NOTE: The sum of the two coefficients A and B should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulae for all currencies, since coefficient A, for the non adjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency are added to the Contract Price.

- 13.9.4 The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates (quoted in the fourth and fifth columns respectively of the table) for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.
- 13.9.5 In cases where the “currency of index” is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the Central Bank of Kenya, of this relevant currency on the above date for which the index is required to be applicable.
- 13.9.6 Until such time as each current cost index is available, the Architect shall determine a provisional index for the issue of Interim Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.
- 13.9.7 If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price, whichever is more favorable to the Procuring Entity.
- 13.9.8 The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

14 CONTRACT PRICE AND PAYMENT

14.1 The Contract Price

14.1.1 Unless otherwise stated in the Special Conditions:

- a) The value of the payment certificate shall be agreed or determined under Sub-Clause 12.3 [Evaluation] and be subject to adjustments in accordance with the Contract;
- b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation];
- c) any quantities which may be set out in the Bill of Materials or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities;

- i. of the Works which the Contractor is required to execute, or
 - ii. for the purposes of Clause 12 [Measurement and Evaluation]; and
- d) the Contractor shall submit to the Engineer, within 30 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Architect may take account of the break down when preparing Payment Certificates but shall not be bound by it.

14.1.2 Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts there for, imported by the Contractor for the sole purpose of executing the Contract shall not be exempt from the payment of import duties and taxes upon importation.

14.2 Advance Payment

14.2.1 The Procuring Entity shall make an advance payment, as an interest-free loan for mobilization and cashflow support, when the Contractor submits a guarantee in accordance with this Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the **Special Conditions of Contract**.

14.2.2 Unless and until the Procuring Entity receives this guarantee, or if the total advance payment is not stated in the Special Conditions of Contract, this Sub-Clause shall not apply.

14.2.3 The Architect shall deliver to the Procuring Entity and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [Application for Interim Payment Certificates]) and after the Procuring Entity receives (i) the Performance Security in accordance with Sub-Clause 4.2 [Performance Security] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be issued by a reputable bank or financial institutions elected by the Contractor and shall be in the form annexed to the Special Conditions or in another form approved by the Procuring Entity.

14.2.4 The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 30 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

14.2.5 Unless stated otherwise in **the Special Conditions of Contract**, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Architect in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates], as follows:

- a) Deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds 30 percent (30%) of the Accepted Contract Amount less Provisional Sums; and
- b) deductions shall be made at the amortization rate stated in the **Special Conditions of Contract** of the amount of each Interim Payment Certificate (excluding the advance payment and deductions for its repayments as well as deductions for retention money) in the currencies and proportions of the advance payment until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 90 percent (90%) of the Accepted Contract Amount less Provisional Sums has been certified for payment.

14.2.6 If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [Termination by Procuring Entity], Clause 16 [Suspension and Termination by Contractor] or Clause 19 [Force Majeure] (as the case may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [Termination by Procuring Entity], except for Sub-Clause 14.2.7 [Procuring Entity's Entitlement to Termination for Convenience], payable by the Contractor to the Procuring Entity.

14.3 Application for Interim Payment Certificates

14.3.1 The Contractor shall submit a Statement (in number of copies indicated in the **Special Conditions of Contract**) to the Architect after the end of each month, in a form approved by the Engineer, showing in detail

the amounts to which the Contractor considers itself to be entitled, together with supporting documents which shall include there portion the progress during this month in accordance with Sub-Clause 4.21 [Progress Reports].

14.3.2 The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

- a) the estimated contract value of the Works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);
- b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost];
- c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in **the Special Conditions of Contract** to the total of the above amounts, until the amount so retained by the Procuring Entity reaches the limit of Retention Money (if any) stated in **the Special Conditions of Contract**;
- d) any amounts to be added for the advance payment and (if more than one instalment) and to be deducted for its repayments in accordance with Sub-Clause 14.2 [Advance Payment];
- e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [Plant and Materials intended for the Works];
- f) any other additions or deductions which may have become due under the Contractor otherwise, including those under Clause 20 [Claims, Disputes and Arbitration]; and
- g) the deduction of amounts certified in all previous Payment Certificates.

14.4 Schedule of Payments

14.4.1 If the Contract includes a schedule of payments specifying the instalments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

- a) The instalments quoted in this schedule of payments shall be the estimated contract values for the purposes of sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates];
- b) Sub-Clause 14.5 [Plant and Materials intended for the Works] shall not apply; and
- c) If these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less or more than that on which this schedule of payments was based, then the Architect may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine revised instalments, which shall take account of the extent to which progress is less or more than that on which the instalments were previously based.

14.4.2 If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

14.5 Plant and Materials intended for the Works

14.5.1 If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates].

14.5.2 If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Schedules, this Sub-Clause shall not apply.

14.5.3 The Architect shall determine and certify each addition if the following conditions are satisfied:

- a) The Contractor has:
 - i. kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection, and
 - ii. submitted statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;

and either:

- b) the relevant Plant and Materials:
 - i. are those listed in the Schedules for payment when shipped,
 - ii. have been shipped to Kenya, enroute to the Site, in accordance with the Contract; and
 - iii. are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Architect together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Procuring Entity in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [Advance Payment] and shall be valid until the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration; or
- c) the relevant Plant and Materials:
 - i. are those listed in the Schedules for payment when delivered to the Site, and
 - ii. have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration and appear to be in accordance with the Contract.

14.5.4 The additional amount to be certified shall be the equivalent of eighty percent (80%) of the Architect determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

14.5.5 The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6 Issue of Interim Payment Certificates

14.6.1 No amount will be certified or paid until the Procuring Entity has received and approved the Performance Security. Thereafter, the Architect shall, within 30 days after receiving a Statement and supporting documents, deliver to the Procuring Entity and to the Contractor an Interim Payment Certificate which shall state the amount which the Architect fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Architect on the Statement if any.

14.6.2 However, prior to issuing the Taking-Over Certificate for the Works, the Architect shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated **in the Special Conditions of Contract**. In this event, the Architect shall give notice to the Contractor accordingly.

14.6.3 An Interim Payment Certificate shall not be withheld for any other reason, although:

- a) if anything supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or
- b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

14.6.4 The Architect may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Architect acceptance, approval, consent or satisfaction.

14.7 Payment

14.7.1 The Procuring Entity shall pay to the Contractor:

- a) The advance payment shall be paid within 60 days after signing of the contract by both parties or within 60 days after receiving the documents in accordance with Sub-Clause 4.2 [Performance Security] and Sub-Clause 14.2 [Advance Payment], whichever is later;
- b) The amount certified in each Interim Payment Certificate within 60 days after the Architect Issues Interim Payment Certificate; and
- c) the amount certified in the Final Payment Certificate within 60 days after the Procuring Entity Issues Interim Payment Certificate; or after determination of any disputed amount shown in the Final Statement

in accordance with Sub-Clause 16.2 [Termination by Contractor].

14.7.2 Payment of the amount due in each currency shall be made into the bank account, nominated by the Contractor, in the payment country (forth is currency) specified in the Contract.

14.8 Delayed Payment

14.8.1 If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [Payment], the Contractor shall be entitled to receive financing charges (simple interest) monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [Payment], irrespective (in the case of its sub-paragraph (b) of the date on which any Interim Payment Certificate is issued.

14.8.2 These financing charges shall be calculated at the annual rate of three percentage points above the mean rate of the Central Bank in Kenya of the currency of payment, or if not available, the inter bank offered rate, and shall be paid in such currency.

14.8.3 The Contractor shall be entitled to this payment without formal notice and certification, and without prejudice to any other right or remedy.

14.9 Payment of Retention Money

14.9.1 When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Architect for payment to the Contractor. If a Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

14.9.2 Promptly after the latest of the expiry dates of the Defects Liability Periods, the outstanding balance of the Retention Money shall be certified by the Architect for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

14.9.3 However, if any work remains to be executed under Clause 11 [Defects Liability], the Architects shall be entitled to withhold certification of the estimated cost of this work until it has been executed.

14.9.4 When calculating these proportions, no account shall be taken of any adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost].

14.9.5 Unless otherwise stated in the Special Conditions, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a Retention Money Security guarantee, in the form annexed to the Special Conditions or in another form approved by the Procuring Entity and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money.

14.9.6 The Procuring Entity shall return the Retention Money Security guarantee to the Contractor within 14 days after receiving a copy of the Completion Certificate.

14.10 Statement at Completion

14.10.1 Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Architect three copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates], showing:

- a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works,
- b) any further sums which the Contractor considers to be due, and
- c) an estimate of any other amounts which the Contractor considers will become due to him under the Contract. Estimated amounts shall be shown separately in this Statement at

completion.

14.10.2 The Architect shall then certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates].

14.11 Application for Final Payment Certificate

14.11.1 Within 60 days after receiving the Completion Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with supporting documents showing in detail in a form approved by the Engineer:

- a) The value of all work done in accordance with the Contract, and
- b) Any further sums which the Contractor considers to be due to him under the Contract otherwise.

14.11.2 If the Architect disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Architect may reasonably require within 30 days from receipt of said draft and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Architect the final statement as agreed. This agreed statement is referred to in these Conditions as the "Final Statement".

14.11.3 However, if, following discussions between the Architect and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Architect shall deliver to the Procuring Entity (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [Obtaining Dispute Board's Decision] or Sub-Clause 20.5 [Amicable Settlement], the Contractor shall then prepare and submit to the Procuring Entity (with a copy to the Engineer) a Final Statement.

14.12 Discharge

When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the outstanding balance of this total, in which event the discharge shall be effective on such date.

14.13 Issue of Final Payment Certificate

14.13.1 Within 30 days after receiving the Final Statement and discharge in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Architect shall deliver, to the Procuring Entity and to the Contractor, the Final Payment Certificate which shall state:

- a) The amount which he fairly determines is finally due, and
- b) After giving credit to the Procuring Entity for all amounts previously paid by the Procuring Entity and for all sums to which the Procuring Entity is entitled, the balance (if any) due from the Procuring Entity to the Contractor or from the Contractor to the Procuring Entity, as the case may be.

14.13.2 If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Architect shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 30 days, the Architect shall issue the Final Payment Certificate for such amount as he fairly determines to be due.

14.14 Cessation of Procuring Entity's Liability

14.14.1 The Procuring Entity shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

- a) in the Final Statement and also,
- b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [Statement at Completion].

14.14.2 However, this Sub-Clause shall not limit the Procuring Entity's liability under his indemnification obligations, or the Procuring Entity's liability in any case of fraud, deliberate default or reckless misconduct

by the Procuring Entity.

14.15 Currencies of Payment

The Contract Price shall be paid in the currency or currencies named in the Schedule of Payment Currencies. If more than one currency is so named, payments shall be made as follows:

- a) If the Accepted Contract Amount was expressed in Local Currency only:
 - i. the proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Schedule of Payment Currencies, except as otherwise agreed by both Parties;
 - ii. payments and deductions under Sub-Clause 13.5 [Provisional Sums] and Sub-Clause 13.7 [Adjustments for Changes in Legislation] shall be made in the applicable currencies and proportions; and
 - iii. other payments and deductions under sub-paragraphs (a) to (d) of Sub-Clause 14.3 [Application for Interim Payment Certificates] shall be made in the currencies and proportions specified in sub-paragraph (a) (i) above;
- b) payment of the damages specified in the Special Conditions of Contract, shall be made in the currencies and proportions specified in the Schedule of Payment Currencies;
- c) other payments to the Procuring Entity by the Contractor shall be made in the currency in which the sum was expended by the Procuring Entity, or in such currency as may be agreed by both Parties;
- d) if any amount payable by the Contractor to the Procuring Entity in a particular currency exceeds the sum payable by the Procuring Entity to the Contractor in that currency, the Procuring Entity may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
- e) if no rates of exchange are stated in the Schedule of Payment Currencies, they shall be those prevailing on the Base Date and determined by the Central Bank of Kenya.

15 TERMINATION BY PROCURING ENTITY

15.1 Notice to correct any defects or failures

If the Contractor fails to carry out any obligation under the Contract, the Architect may by notice require the Contractor to make good the failure and to remedy it within 30 days.

15.2 Termination by Procuring Entity

15.2.1 The Procuring Entity shall be entitled to terminate the Contract if the Contractor breaches the contract based on following circumstances which shall include but not limited to:

- a) fails to comply with Sub-Clause 4.2 [Performance Security] or with a notice under Sub-Clause 15.1 [Notice to Correct],
- b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,
- c) without reasonable excuse fails:
 - i. to proceed with the Works in accordance with Clause 8 [Commencement, Delays and Suspension], or
 - ii. to comply with a notice issued under Sub-Clause 7.5 [Rejection] or Sub-Clause 7.6 [Remedial Work], within 30 days after receiving it,
- d) subcontracts the major part or whole of the Works or assigns the Contract without the consent of the Procuring Entity,
- e) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or
- f) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an induce mentor reward:
 - i. for doing or for bearing to do any action in relation to the Contract, or
 - ii. for showing or for bearing to show favor or disfavor to any person in relation to the Contract, or
 - iii. if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such induce mentor reward as is described in this sub-paragraph (f).

However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination, or

- g) If the contract or repeatedly fails to remedy delivers defective work,
- h) based on reasonable evidence, has engaged in Fraud and Corruption as defined in paragraph 2.2 of the Appendix B to these General Conditions, incompeting for or in executing the Contract.

15.2.2 In any of these events or circumstances, the Procuring Entity may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in the case of subparagraph (e) or (f) or (g) or (h), the Procuring Entity may by notice terminate the Contract immediately.

15.2.3 The Procuring Entity's election to terminate the Contract shall not prejudice any other rights of the Procuring Entity, under the Contractor otherwise.

15.2.4 The Contractor shall then leave the Site and deliver any required Goods, all Contractor's Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

15.2.5 After termination, the Procuring Entity may complete the Works and/ or arrange for any other entities to do so. The Procuring Entity and these entities may then use any Goods, Contractor's Documents and other design documents made by or on behalf of the Contractor.

15.2.6 The Procuring Entity shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal, at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due to the Procuring Entity, these items may be sold by the Procuring Entity in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

15.3 Valuation at Date of Termination

Assoon as practicable after a notice of termination under Sub-Clause 15.2 [Termination by Procuring Entity] has taken effect, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

15.4 Payment after Termination

After a notice of termination under Sub-Clause 15.2 [Termination by Procuring Entity] has taken effect, the Procuring Entity may:

- a) Proceed in accordance with Sub-Clause 2.5 [Procurin Entity's Claims],
- b) withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Procuring Entity, have been established, and/ or
- c) recover from the Contractor any losses and damages incurred by the Procuring Entity and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3 [Valuation at Date of Termination]. After recovering any such losses, damages and extra costs, the Procuring Entity shall pay any balance to the Contractor.

15.5 Procuring Entity's Entitlement to Termination for Convenience

The Procuring Entity shall be entitled to terminate the Contract, at any time at the Procuring Entity's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 30 days after the later of the dates on which the Contractor receives this notice or the Procuring Entity returns the Performance Security. The Procuring Entity shall not terminate the Contract under this Sub-Clause in order to execute the Works itself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 [Termination by Contractor]. After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and shall be paid in accordance with Sub-Clause 16.4 [Payment on Termination].

15.6 Fraud and Corruption

The Contractor shall ensure compliance with the Kenya Government's Anti-Corruption Laws and its prevailing sanctions.

15.7 Corrupt gifts and payments of commission

15.7.1 The Contractor shall not;

- a) Offer or give or agree to give to any person in the service of the Procuring Entity any gift or consideration of any kind as an inducement or reward for doing or for bearing to door for having done or for borne to do any act in relation to the obtaining or execution of this or any other Contract for the Procuring Entity or for showing or for bearing to show favor or disfavor to any person in relation to this or any other contract for the Procuring Entity.
- b) Enter into this or any other contract with the Procuring Entity in connection with which commission has been paid or agreed to be paid by him or on his behalf or to his knowledge, unless before the Contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment there of have been disclosed in writing to the Procuring Entity.

15.7.2 Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the provisions of the Public Procurement and Asset Disposal Act (2015) and the Anti-Corruption and Economic Crimes Act (2003) of the Laws of Kenya.

16 SUSPENSION AND TERMINATION BY CONTRACTOR

16.1 Contractor's Entitlement to Suspend Work

16.1.1 If the Architect fails to certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates] or Sub-Clause 14.7 [Payment], or not receiving instructions that would enable the contractor to proceed with the works in accordance with the program, the Contractor may, after giving not less than 30 days' notice to the Procuring Entity, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.

16.1.2 The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [Delayed Payment] and to termination under Sub-Clause 16.2 [Termination by Contractor].

16.1.3 If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

16.1.4 If the Contractor suffers delay and/or incurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Sub-Clause, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- b) payment of any such Cost-plus profit, which shall be included in the Contract Price.

16.2 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

16.3 Termination by Contractor

16.3.1 The Contractor shall be entitled to terminate the Contract if:

- a) the Architect fails, within 60 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate,
- b) the Contractor does not receive the amount due under an Interim Payment Certificate within 90 days after the expiry of the time stated in Sub-Clause 14.7 [Payment] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [Procuring Entity's Claims]),
- c) the Procuring Entity substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/or the ability of the Contractor to perform the Contract,
- d) a prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [Prolonged Suspension], or
- e) the Procuring Entity becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a

receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events.

- f) the Contractor does not receive the Architect instruction recording the agreement of both Parties on the fulfilment of the conditions for the Commencement of Works under Sub-Clause 8.1 [Commencement of Works].

16.3.2 In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Procuring Entity, terminate the Contract. However, in the case of sub-paragraph (f) or (g), the Contractor may by notice terminate the Contract immediately.

16.3.3 The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract otherwise.

16.4 Cessation of Work and Removal of Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [Procuring Entity's Entitlement to Termination for Convenience], Sub-Clause 16.2 [Termination by Contractor] or Sub-Clause 19.6 [Optional Termination, Payment and Release] has taken effect, the Contractor shall promptly:

- a) cease all further work, except for such work as may have been instructed by the Architect for the protection of life or property or for the safety of the Works,
- b) hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment, and
- c) remove all other Goods from the Site, except as necessary for safety, and leave the Site.

16.5 Payment on Termination

After a notice of termination under Sub-Clause 16.2 [Termination by Contractor] has taken effect, the Procuring Entity shall promptly:

- a) Return the Performance Security to the Contractor,
- b) pay the Contractor in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release], and
- c) pay to the Contractor the amount of any loss or damage sustained by the Contractor as a result of this termination.

17 RISK AND RESPONSIBILITY

17.1 Indemnities

17.1.1 The Contractor shall indemnify and hold harmless the Procuring Entity, the Procuring Entity's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

- a) Bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, or any of their respective agents, and
- b) damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

17.1.2 The Procuring Entity shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in sub-paragraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [Insurance Against Injury to Persons and Damage to Property], unless and to the extent that any such damage or loss is attributable to any negligence, willful act or breach of the Contract by the contractor, the contractor's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

17.2 Contractor's Care of the Works

- 17.2.1 The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [Taking Over of the Works and Sections]) for the Works, when responsibility for the care of the Works shall pass to the Procuring Entity. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Procuring Entity.
- 17.2.2 After responsibility has accordingly passed to the Procuring Entity, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.
- 17.2.3 If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 17.3 [Procuring Entity's Risks], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.
- 17.2.4 The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3 Procuring Entity's Risks

The risks referred to in Sub-Clause 17.4 [Consequences of Procuring Entity's Risks] below, in so far as they directly affect the execution of the Works in Kenya, are:

- a) War hostilities (whether war be declared or not),
- b) rebellion, riot, commotion or disorder, terrorism, sabotage by persons other than the Contractor's Personnel,
- c) explosive materials, ionizing gradiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such explosives, radiation or radio-activity,
- d) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds,
- e) use or occupation by the Procuring Entity of any part of the Permanent Works, except as may be specified in the Contract,
- f) design of any part of the Works by the Procuring Entity's Personnel or by others for whom the Procuring Entity is responsible, and
- g) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventive precautions.

17.4 Consequences of Procuring Entity's Risks

- 17.4.1 If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Architect and shall rectify this loss or damage to the extent required by the Engineer.
- 17.4.2 If the Contractor suffers delay and/ or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
- a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - b) Payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (e) and (g) of Sub-Clause 17.3 [Procuring Entity's Risks], Accrued Costs shall be payable.
- 17.4.3 After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

17.5 Intellectual and Industrial Property Rights

- 17.5.1 In this Sub-Clause, "infringement" shall refer to an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" shall refer to a claim (or proceedings pursuing a claim) alleging an

infringement.

- 17.5.2 Whenever a Party does not give notice to the other Party of any claim within 30 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.
- 17.5.3 The Procuring Entity shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:
- a) An unavoidable result of the Contractor's compliance with the Contract, or
 - b) A result of any Works being used by the Procuring Entity:
 - i. for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or
 - ii. in conjunction with anything not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.
- 17.5.4 The Contractor shall indemnify and hold the Procuring Entity harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.
- 17.5.5 If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.
- 17.5.6 For operation and maintenance of any plant or equipment installed, the contractor shall grant a non-exclusive and non-transferable license to the Procuring Entity under the patent, utility models, or other intellectual rights owned by the contractor or a third party from whom the contractor has received the rights to grant sub-licenses and shall also grant to the Procuring Entity a non-exclusive and non-transferable right (without the right to sub-license) to use the know-how and other technical information disclosed to the contractor or under the contract. Nothing contained here-in shall be construed as transferring ownership of any patent, utility model, trademark, design, copy right, know-how or other intellectual rights from the contractor or any other third party to the Procuring Entity.

17.6 Limitation of Liability

- 17.6.1 Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contractor for any consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [Delay Damages]; Sub-Clause 11.2 [Cost of Remedying Defects]; Sub-Clause 15.4 [Payment after Termination]; Sub-Clause 16.4 [Payment on Termination]; Sub-Clause 17.1 [Indemnities]; Sub-Clause 17.4(b) [Consequences of Procuring Entity's Risks] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights].
- 17.6.2 The total liability of the Contractor to the Procuring Entity, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Procuring Entity's Equipment and Free-Issue Materials], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in **the Special Conditions of Contract**, or (if such multiplier or other sum is not so stated) the Accepted Contract Amount.
- 17.6.3 This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

17.7 Use of Procuring Entity's Accommodation/Facilities

- 17.7.1 The Contractor shall take full responsibility for the care of the Procuring Entity provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).
- 17.7.2 If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Procuring Entity is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.

18 INSURANCE

18.1 General Requirements for Insurances

- 18.1.1 In this Clause, “insuring Party” means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.
- 18.1.2 Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Procuring Entity. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.
- 18.1.3 Wherever the Procuring Entity is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.
- 18.1.4 If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Procuring Entity shall act for Procuring Entity's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.
- 18.1.5 Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.
- 18.1.6 The relevant insuring Party shall, within the respective periods stated in **the Special Conditions of Contract** (calculated from the Commencement Date), submit to the other Party:
- a) Evidence that the insurances described in this Clause have been affected, and
 - b) copies of the policies for the insurances described in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment] and Sub-Clause 18.3 [Insurance against Injury to Persons and Damage to Property].
- 18.1.7 When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.
- 18.1.8 Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.
- 18.1.9 Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or at tempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.
- 18.1.10 If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.
- 18.1.11 Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Procuring Entity, under the other terms of the Contract otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Procuring Entity.
- 18.1.12 Procuring Entity in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

18.1.13 Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [Procuring Entity's Claims] or Sub-Clause 20.1 [Contractor's Claims], as applicable.

18.1.14 The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to the insurance referred to Clause 18) with insurers from any eligible source country.

18.2 Insurance for Works and Contractor's Equipment

18.2.1 The insuring Party shall insure the Works, Plant, Material and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [General Requirements for Insurances], until the date of issue of the Taking-Over Certificate for the Works.

18.2.2 The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability]).

18.2.3 The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

18.2.4 Unless otherwise stated in the Special Conditions, insurances under this Sub-Clause:

- a) Shall be effected and maintained by the Contractor as insuring Party,
- b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the costs of rectifying the loss or damage,
- c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [Procuring Entity's Risks],
- d) shall also cover, to the extent specifically required in the tendering documents of the Contract, loss or damage to a part of the Works which is attributable to the use or occupation by the Procuring Entity of another part of the Works, and loss or damage from the risks listed in sub-paragraphs (c), (g) and (h) of Sub-Clause 17.3 [Procuring Entity's Risks], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated **in the Special Conditions** of Contract (if an amount is not so stated, this sub-paragraph (d) shall not apply), and
- e) may however exclude loss of, damage to, and reinstatement of:
 - i. a part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below),
 - ii. a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship,
 - iii. a part of the Works which has been taken over by the Procuring Entity, except to the extent that the Contractor is liable for the loss or damage, and
 - iv. Goods while they are not in Kenya, subject to Sub-Clause 14.5 [Plant and Materials intended for the Works].

18.2.5 If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Procuring Entity, with supporting particulars. The Procuring Entity shall then (i) be entitled subject to Sub-Clause 2.5 [Procuring Entity's Claims] to payment of an amount equivalent to such commercially reasonable terms as the Contractor should have expected to have paid for such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [General Requirements for Insurances].

18.3 Insurance against Injury to Persons and Damage to Property

18.3.1 The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 18.4 [Insurance for Contractor's Personnel]), which may arise out of the Contractor's performance of the Contract and occurring

before the issue of the Performance Certificate.

- 18.3.2 This insurance shall be for a limit per occurrence of not less than the amount stated in **the Special Conditions of Contract**, with no limit on the number of occurrences. If an amount is not stated in the **Special Conditions of Contract**, this Sub-Clause shall not apply.
- 18.3.3 Unless otherwise stated in the Special Conditions, the insurances specified in this Sub-Clause:
- a) Shall be effected and maintained by the Contractor as insuring Party,
 - b) shall be in the joint names of the Parties,
 - c) shall be extended to cover liability for all loss and damage to the Procuring Entity's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and
 - d) may however exclude liability to the extent that it arises from:
 - i. the Procuring Entity's right to have the Permanent Works executed on, over, under, in or
 - ii. through any land, and to occupy this land for the Permanent Works,
 - iii. damage which is an unavoidable result of the Contractor's obligations to execute the
 - iv. Works and remedy any defects, and
 - v. a cause listed in Sub-Clause 17.3 [Procuring Entity's Risks], except to the extent that cover is available at commercially reasonable terms.

18.4 Insurance for Contractor's Personnel

- 18.4.1 The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.
- 18.4.2 The insurance shall cover the Procuring Entity and the Architect against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Procuring Entity or of the Procuring Entity's Personnel.
- 18.4.3 The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

19 FORCE MAJEURE

19.1 Definition of Force Majeure

- 19.1.1 In this Clause, "Force Majeure" means an exceptional event or circumstance:
- a) Which is beyond a Party's control,
 - b) Which such Party could not reasonably have provided against before entering into the Contract,
 - c) which, having arisen, such Party could not reasonably have avoided or overcome, and
 - d) which is not substantially attributable to the other Party.
- 19.1.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:
- a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
 - b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war,
 - c) riot, commotion, disorder, strike or lock out by persons other than the Contractor's Personnel,
 - d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and
 - e) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

19.2 Notice of Force Majeure

- 19.2.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

19.2.2 The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

19.2.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

19.3 Duty to Minimize Delay

Each Party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure. A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

19.4 Consequences of Force Majeure

19.4.1 If the Contractor is prevented from performing his substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- b) if the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 [Definition of Force Majeure] and, in sub-paragraphs (ii) to (iv), occurs in Kenya, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment].

19.4.2 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

19.5 Force Majeure Affecting Subcontractor

If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

19.6 Optional Termination, Payment and Release

19.6.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment].

19.6.2 Upon such termination, the Architect shall determine the value of the work done and issue a Payment Certificate which shall include:

- a) the amount payable for any work carried out for which a price is stated in the Contract;
- b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Procuring Entity when paid for by the Procuring Entity, and the Contractor shall place the same at the Procuring Entity's disposal;
- c) other Cost or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;
- d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and
- e) the Cost of repatriation of the Contractor's staff and lab or employed wholly in connection with the Works at the date of termination.

19.7 Release from Performance

Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the Contract,

entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance:

- (a) The Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and
- (b) The sum payable by the Procuring Entity to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [Optional Termination, Payment and Release] if the Contract had been terminated under Sub-Clause 19.6.

20 SETTLEMENT OF CLAIMS AND DISPUTES

20.1 Contractor's Claims

- 20.1.1 If the Contractor considers itself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give Notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 30 days after the Contractor became aware, or should have become aware, of the event or circumstance.
- 20.1.2 If the Contractor fails to give notice of a claim within such period of 30 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Procuring Entity shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.
- 20.1.3 The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.
- 20.1.4 The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at an other location acceptable to the Engineer. Without admitting the Procuring Entity's liability, the Architect may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/ or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Architect to inspect all these records and shall (if instructed) submit copies to the Engineer.
- 20.1.5 Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Architect fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/ or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:
- a) This fully detailed claim shall be considered as interim;
 - b) The Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/ or amount claimed, and such further particulars as the Architect may reasonably require; and
 - c) The Contractor shall send a final claim within 30 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.
- 20.1.6 Within 42 days after receiving a Notice of a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Architect and approved by the Contractor, the Architect shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars but shall nevertheless give his response on the principles of the claim within the above defined time period.
- 20.1.7 Within the above defined period of 42 days, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.
- 20.1.8 Each Payment Certificate shall include such additional payment for any claim as has been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.
- 20.1.9 If the Architect does not respond within the time frame defined in this Clause, either Party may consider that the claim is rejected by the Architect and any of the Parties may refer the dispute for amicable settlement in accordance with Clause 20.3.

20.1.10 The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/ or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause 20.3.

20.2 Procuring Entity's Claims

20.2.1 If the Procuring Entity considers itself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Procuring Entity or the Architect shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 [Electricity, Water and Gas], under Sub-Clause 4.20 [Procuring Entity's Equipment and Free-Issue Materials], or for other services requested by the Contractor.

20.2.2 The notice shall be given as soon as practicable and no longer than 30 days after the Procuring Entity became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

20.2.3 The particulars shall specify the Clause or other basis of the claim and shall include substantiation of the amount and/or extension to which the Procuring Entity considers itself to be entitled in connection with the Contract. The Architect shall then proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the amount (if any) which the Procuring Entity is entitled to be paid by the Contractor, and/ or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [Extension of Defects Notification Period].

20.2.4 This amount may be included as a deduction in the Contract Price and Payment Certificates. The Procuring Entity shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

20.3 Amicable Settlement

Where a notice of a claim has been given, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, the Party giving a notice of a claim in accordance with Sub-Clause 20.1 above should move to commence arbitration after 60 days from the day on which a notice of a claim was given, even if no attempt at an amicable settlement has been made.

20.4 Matters that may be referred to arbitration

Notwithstanding anything stated herein the following matters may be referred to arbitration before the practical completion of the Works or abandonment of the Works or termination of the Contract by either party:

- a) Whether or not the issue of an instruction by the Architect is empowered by these Conditions.
- b) Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
- c) Any dispute arising in respect risks arising from matters referred to in Clause 17.3 and Clause 19
- d) All other matters shall only be referred to arbitration after the completion or alleged completion of the Works or termination or alleged termination of the Contract, unless the Procuring Entity and the Contractor agree otherwise in writing.

20.5 Arbitration

20.5.1 Any claim or dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.3 shall be finally settled by arbitration.

20.5.2 No arbitration proceedings shall be commenced on any claim or dispute where notice of a claim or dispute has not been given by the applying party within ninety days of the occurrence or discovery of the matter or issue giving rise to the dispute.

20.5.3 Notwithstanding the issue of a notice as stated above, the arbitration of such a claim or dispute shall not commence unless an attempt has in the first instance been made by the parties to settle such claim or dispute amicably with or without the assistance of third parties. Proof of such attempt shall be required.

20.5.4 The Arbitrator shall, without prejudice to the generality of his powers, have powers to direct such measurements, computations, tests or valuations as may in his opinion be desirable in order to determine the

rights of the parties and assess and award any sums which ought to have been the subject of or included in any certificate.

- 20.5.5 The Arbitrator shall, without prejudice to the generality of his powers, have powers to open up, review and revise any certificate, opinion, decision, requirement or notice and to determine all matters in dispute which shall be submitted to him in the same manner as if no such certificate, opinion, decision require mentor notice had been given.
- 20.5.6 The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Architect from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.
- 20.5.7 Neither Party shall be limited in the proceedings before the arbitrators to the evidence, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction.
- 20.5.8 Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, and the Architect shall not be altered by reason of any arbitration being conducted during the progress of the Works.
- 20.5.9 The terms of the remuneration of each or all the members of Arbitration shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

20.6 Arbitration with National Contractors

- 20.6.1 If the Contract is with national contractors, arbitration proceedings will be conducted in accordance with the Arbitration Laws of Kenya. In case of any claim or dispute, such claim or dispute shall be notified in writing by either party to the other with a request to submit it to arbitration and to concur in the appointment of an Arbitrator within thirty days of the notice. The dispute shall be referred to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed, on the request of the applying party, by the Chairman or Vice Chairman of any of the following professional institutions;
- i. Architectural Association of Kenya
 - ii. Institute of Quantity Surveyors of Kenya
 - iii. Association of Consulting Engineers of Kenya
 - iv. Chartered Institute of Arbitrators (Kenya Branch)
 - v. Institution of Engineers of Kenya
- 20.6.2 The institution written to first by the aggrieved party shall take precedence over all other institutions.

20.7 Arbitration with Foreign Contractors

- 20.7.1 Arbitration with foreign contractors shall be conducted in accordance with the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL); or with proceedings administered by the International Chamber of Commerce (ICC) and conducted under the ICC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules.
- 20.7.2 The place of arbitration shall be a location specified in the SCC; and the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [Law and Language].

20.8 Alternative Arbitration Proceedings

Alternatively, the Parties may refer the matter to the Nairobi Centre for International Arbitration (NCIA) which offers a neutral venue for the conduct of national and international arbitration with commitment to providing institutional support to the arbitral process.

20.9 Failure to Comply with Arbitrator's Decision

- 20.9.1 The award of such Arbitrator shall be final and binding upon the parties.
- 20.9.2 In the event that a Party fails to comply with a final and binding Arbitrator's decision, then the other Party may, without prejudice to any other rights it may have, refer the matter to a competent court of law.

20.10 Contract operations to continue

Notwithstanding any reference to arbitration herein,

- 1.1.1 the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
- 1.1.2 the Procuring Entity shall pay the Contractor any monies due the Contractor.

Section IX - Special Conditions of Contract

The following Special Conditions shall supplement the GCC. Whenever there is a conflict, the provisions here in shall prevail over those in the GCC.

Conditions	Sub-Clause	Data
Part A - Contract Data		
Procuring Entity's name and address	Heading	PARLIAMENTARY JOINT SERVICES. P.O BOX 41842- 00100 NAIROBI KENYA
Name and Reference No. of the Contract	Heading and 1.1	Construction of the Proposed Centre for Parliamnetary Studies and Training on Plot L.R. No.28172, Karen, Nairobi. Tender No. PJS/012/2021-2022
Engineers Name and address	Heading and 3.1.1	ARPRIM CONSULTANTS P.O BOX 12969-00400 NAIROBI KENYA
Contractor's Representative's name	4.3.1	
Key Personnel names	16.9.1	
Time for Completion	1.1.	<i>As quoted in the form of tender</i>
Defects Notification Period	1.1	12 MONTHS
Sections	1.1	<i>If Sections are to be used, refer to Table: Summary of Sections below</i>
Electronic transmission systems	1.3	Applicable.
Time for the Parties entering into a Contract Agreement	1.6	Within 30 days
Commencement Date	8.1.1	TO BE AGREED WITH PROJECT MANAGER
Time for access to the Site	2.1.1	No later than the Commencement Date, and not later than _____14_____ days after Commencement Date
Architect Duties and Authority	3.1.6 (b) (ii)	Variations resulting in an increase of the Accepted Contract Amount shall require approval of the Procuring Entity. Any suspension shall require the approval of the Procuring Entity.
Performance Security	4.2.1	The performance security will be in the form of a bank guarantee from a reputable bank or financial institution recognized by the Central Bank of Kenya in the amount(s) of 10% percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.
Normal working hours	6.5	Specify
Delay damages for the Works	8.7 & 14.15(b)	0.006 % of the Contract Price per day. <i>If Sections are to be used, refer to Table: Summary of Sections below</i>
Maximum amount of delay damages	8.7.1	3_ % of the final Contract Price.
Provisional Sums	13.6. (b)(ii)	<i>[If there are Provisional Sums, insert a percentage for adjustment of Provisional Sums]</i> _____%
Adjustments for Changes in Cost	13.9	Period "n" applicable to the adjustment multiplier "Pn": _____ <i>[Insert the period if different from one (1) month; if period "n" is one (1) month, insert "not applicable"]</i>
Currency of Payments	14.15	All payments under the contract (including the contract price) shall be made in Kenya Shillings.
Total advance payment	14.2.1	There shall be no advance payment.

Conditions	Sub-Clause	Data
Repayment amortization rate of advance payment	14.2.5 (b)	_____ %
Percentage of Retention	14.3.2 (c)	<u>10</u> %
Limit of Retention Money	14.3.2 (c)	<u>5</u> % of the Accepted Contract Amount
Plant and Materials	14.5.3(b)(i)	If Sub-Clause 14.5 applies: Plant and Materials for payment Free on Board <u>N/A</u> [list].
	14.5.3(c)(i)	Plant and Materials for payment when delivered to the Site _____ [list]. Plant And Materials to be Incorporated into Permanent Work
Minimum Amount of Interim Payment Certificates	14.6.2	<u>N/A</u> % of the Accepted Contract Amount.
Publishing source of commercial interest rates for financial charges in case of delayed payment	14.8	There shall be no payment of interest on delayed payments.
Maximum total liability of the Contractor to the Procuring Entity	17.6.2	[Select one of the two options below as appropriate] The product of _____ [insert a multiplier less or greater than one] times the Accepted Contract Amount, or _____ [insert amount of the maximum total liability]
Periods for submission of insurance: a. evidence of insurance. b. relevant policies	18.1.6	<u>14</u> days <u>14</u> days
Maximum amount of deductibles for insurance of the Procuring Entity's risks	18.2.4 (d)	<i>NIL</i>
Minimum amount of third-party insurance	18.3.2	<i>KSH 100,000,000</i>
Force Majeure events	19.1.2	<i>Add (f) pandemic</i>
The place of arbitration	20.7.2	<i>Nairobi, Kenya</i>

SECTION X - CONTRACT FORMS

FORM No. 1 - NOTIFICATION OF INTENTION TO AWARD

FORM NO. 2 – REQUEST FOR REVIEW

FORM No. 3-LETTEROF AWARD

FORM No. 4 - CONTRACT AGREEMENT

FORM No. 5 - PERFORMANCE SECURITY [Option 1 - Unconditional Demand Bank Guarantee]

FORM No. 6- PERFORMANCE SECURITY [Option 2– Performance Bond]

FORM No. 7 - ADVANCE PAYMENT SECURITY

FORM No. 8 - RETENTION MONEY SECURITY

FORM No 1: NOTIFICATION OF INTENTION TOAWARD OF CONTRACT

This Notification of Award shall be sent to each Tenderer that submitted a Tender and was not successful. Send this Notification to the Tenderer's Authorized Representative named in the Tender Information Form on the format below.

FORMAT

1. For the attention of Tenderer's Authorized Representative

- i) Name: *[insert Authorized Representative's name]*
- ii) Address: *[insert Authorized Representative's Address]*
- iii) Telephone: *[insert Authorized Representative's telephone/fax numbers]*
- iv) Email Address: *[insert Authorized Representative's email address]*

[IMPORTANT: insert the date that this Notification is transmitted to Tenderers. The Notification must be sent to all Tenderers simultaneously. This means on the same date and as close to the same time as possible.]

2. Date of transmission: *[email]* on *[date]* (local time)

This Notification is sent by *(Name and designation)* _____

3. Notification of Award

- i) Procuring Entity: *[insert the name of the ProcuringEntity]*
- ii) Project: *[insert name ofproject]*
- iii) Contract title: *[insert the name of thecontract]*
- iv) ITT No: *[insert ITT reference number from ProcurementPlan]*

This Notification of Intention to Award (Notification) notifies you of our decision to award the above contract. The transmission of this Notification begins the Standstill Period. During the Standstill Period, you may:

4. Request a debriefing in relation to the evaluation of your tender by submitting a Procurement-related Complaint in relation to the decision to award the contracts.

a) The successful tenderers

i) Name of successful Tender _____

ii) Address of the successful Tender _____

iii) Contract price of the successful Tender Kenya Shillings _____
(in words _____)

b) The reasons for your tender being unsuccessful are as follows:

c) OtherTenderers

Names of all Tenderers that submitted a Tender. If the Tender's price was evaluated include the evaluated price as well as the Tender price as read out.

SNo	Name of Tender	Tender Price as read out	Tender's evaluated price (Note a)	One Reason Why Not Evaluated
1				
2				
3				
4				
5				

(Note a) State NE if not evaluated

5. How to request a debriefing

- a) DEADLINE: The dead line to request a debriefing expires at midnight on [*insert date*] (*local time*).
- b) You may request a debriefing in relation to the results of the evaluation of your Tender. If you decide to request a debriefing your written request must be made within three (5) Business Days of receipt of this Notification of Intention to Award.
- c) Provide the contract name, reference number, name of the Tenderer, contact details; and address the request for debriefing as follows:
 - i) Attention: [*insert full name of person, if applicable*]
 - ii) Title/position: [*insert title/position*]
 - iii) Agency: [*insert name of Procuring Entity*]
 - iv) Email address: [*insert email address*]
- d) If your request for a debriefing is received within the 3 Days deadline, we will provide the debriefing within five (3) Business Days of receipt of your request. If we are unable to provide the debriefing within this period, the Standstill Period shall be extended by five (3) Days after the date that the debriefing is provided. If this happens, we will notify you and confirm the date that the extended Standstill Period will end.
- e) The debriefing may be in writing, by phone, video conference call or in person. We shall promptly advise you in writing how the debriefing will take place and confirm the date and time.
- f) If the deadline to request a debriefing has expired, you may still request a debriefing. In this case, we will provide the debriefing as soon as practicable, and normally no later than fifteen (15) Days from the date of publication of the Contract Award Notice.

6. How to make a complaint

- a) Period: Procurement-related Complaint challenging the decision to award shall be submitted by midnight, [*insert date*] (*local time*).
- b) Provide the contract name, reference number, name of the Tenderer, contact details; and address the Procurement-related Complaint as follows:
 - i) Attention: [*insert full name of person, if applicable*]
 - ii) Title/position: [*insert title/ position*]
 - iii) Agency: [*insert name of Procuring Entity*]
 - iv) Email address: [*insert email address*]
- c) At this point in the procurement process, you may submit a Procurement-related Complaint challenging the decision to award the contract. You do not need to have requested, or received, a debriefing before making this complaint. Your complaint must be submitted within the Standstill Period and received by us before the Standstill Period ends.
- d) Further information: For more information refer to the Public Procurement and Disposals Act 2015 and its Regulations available from the Website www.ppra.go.ke.

You should read these documents before preparing and submitting your complaint.

- e) There are four essential requirements:
 - i) You must be an 'interested party'. In this case, that means a Tenderer who submitted a Tender in this tendering process and is the recipient of a Notification of Intention to Award.
 - ii) The complaint can only challenge the decision to award the contract.
 - iii) You must submit the complaint within the period stated above.
 - iv) You must include, in your complaint, all of the information required to support your complaint.

7. Standstill Period

- i) **DEADLINE:** The Standstill Period is due to end at midnight on [*insert date*] (local time).
- ii) The Standstill Period lasts ten (14) Days after the date of transmission of this Notification of Intention to Award.
- iii) The Standstill Period may be extended as stated in paragraph Section 5(d) above.

If you have any questions regarding this Notification please do not hesitate to contact us. On behalf of the Procuring Entity:

Signature: _____

Name: _____

Title/position: _____

Telephone: _____

FORM NO. 2- REQUEST FOR REVIEW

FORM FOR REVIEW (r.203(1))

PUBLIC PROCUREMENT ADMINISTRATIVE REVIEW BOARD

APPLICATION NO.....OF.....20.....

BETWEEN

.....APPLICANT

AND

.....RESPONDENT (Procuring Entity)

Request for review of the decision of the..... (Name of the Procuring Entity ofdated the...day of20.....in the matter of Tender No.....of20..... for (Tender description).

REQUEST FOR REVIEW

I/We.....,the above named Applicant(s), of address: Physical address.....P. O. Box No.....
Tel. No.....Email, hereby request the Public Procurement Administrative Review Board to review the whole/part of the above mentioned decision on the following grounds , namely:

- 1.
- 2.

By this memorandum, the Applicant requests the Board for an order/orders that:

- 1.
- 2.

SIGNED(Applicant) Dated on.....day of/...20.....

FOR OFFICIAL USE ONLY Lodged with the Secretary Public Procurement Administrative Review Board on.....day of20.....

SIGNED

Board Secretary

FORM NO 3: LETTER OF AWARD

letterhead paper of the Procuring Entity]

[date]

To: *[name and address of the Contractor]*

This is to notify you that your Tender dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words]* *[name of currency]*, as corrected and modified in accordance with the Instructions to Tenderers, is here by accepted by..... *(name of Procuring Entity)*.

You are requested to furnish the Performance Security within in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms included in Section VIII, Contract Forms, of the Tender Document.

Authorized Signature:

Name and Title of Signatory:

Name of Procuring Entity:

Attachment: *Contract Agreement*:

FORM NO 4: CONTRACT AGREEMENT

THIS AGREEMENT made the day of..... 20....., between.....
.....of..... (hereinafter “the Procuring Entity”), of the one part, and _____ of _____ (hereinafter “the Contractor”), of the other part:

WHEREAS the Procuring Entity desires that the Works known as _____ should be executed by the Contractor, and has accepted a Tender by the Contractor for the execution and completion of these Works and the remedying of any defects there in,

The Procuring Entity and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - a) the Notification of Award
 - b) the Form of Tender
 - c) the addenda Nos _____ (if any)
 - d) the Special Conditions of Contract
 - e) the General Conditions of Contract;
 - f) the Specifications
 - g) the Drawings; and
 - h) the completed Schedules and any other documents forming part of the contract.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as specified in this Agreement, the Contractor here by covenants with the Procuring Entity to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Procuring Entity here by covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects there in, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS where of the parties here to have caused this Agreement to be executed in accordance with the Laws of Kenya on the day, month and year specified above.

Signed and sealed by _____ (for the Procuring Entity)

Signed and sealed by _____ (for the Contractor).

FORM NO. 5 - PERFORMANCE SECURITY

[Option 1 - Unconditional Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: *[insert name and Address of Procuring Entity]*

Date: _____ *[Insert date of issue]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with (name of Procuring Entity) _____ (the Procuring Entity as the Beneficiary), for the execution of _____ (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.
3. At the request of the Contractor, we as Guarantor, here by irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (in words),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.
4. This guarantee shall expire, no later than the.....Day of.....,2.....², and any demand for payment under it must be received by us at the office indicated above on or before that date.
5. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months] [one year]*, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”

[Name of Authorized Official, signature(s) and seals/stamps]

Note: *All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.*

¹The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency of the Contract or a freely convertible currency acceptable to the Beneficiary.

²Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM No. 6- PERFORMANCE SECURITY

[Option 2– Performance Bond]

[Note: Procuring Entities are advised to use Performance Security – Unconditional Demand Bank Guarantee in stead of Performance Bond due to difficulties involved in calling Bond holder to action]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of Procuring Entity]*

Date: _____ *[Insert date of issue]*

PERFORMANCE BOND No.: _____

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. By this Bond _____ as Principal (hereinafter called “the Contractor”) and _____] as Surety (hereinafter called “the Surety”), are held and firmly bound unto _____] as Obligee (hereinafter called “the Procuring Entity”) in the amount of _____ for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.
2. WHEREAS the Contractor has entered into a written Agreement with the Procuring Entity dated the _____ day of _____, 20_____, for _____ in accordance with the documents, plans, specifications, and amendments there to, which to the extent here in provided for, are by reference made part here of and are here in after referred to as the Contract.
3. NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Procuring Entity to be, in default under the Contract, the Procuring Entity having performed the Procuring Entity's obligations there under, the Surety may promptly remedy the default, or shall promptly:
 - a) Complete the Contract in accordance with its terms and conditions; or
 - b) Obtain a tender or tenders from qualified tenderers for submission to the Procuring Entity for completing the Contract in accordance with its terms and conditions, and upon determination by the Procuring Entity and the Surety of the lowest responsive Tenderers, arrange for a Contract between such Tenderer, and Procuring Entity and make a available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term “Balance of the Contract Price,” as used in this paragraph, shall mean the total amount payable by Procuring Entity to Contractor under the Contract, less the amount properly paid by Procuring Entity to Contractor; or
 - c) Pay the Procuring Entity the amount required by Procuring Entity to complete the Contract in accordance with its terms and conditions upto a total not exceeding the amount of this Bond.
4. The Surety shall not be liable for a greater sum than the specified penalty of this Bond.
5. Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate. No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Procuring Entity named here in or the heirs, executors, administrators, successors, and assigns of the Procuring Entity.
6. In testimony whereof, the Contractor has here unto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly at tested by the signature of his legal representative, this day _____ of _____ 20_____.

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

FORM NO. 7 - ADVANCE PAYMENT SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ [Insert name and Address of Procuring Entity]

Date: _____ [Insert date of issue]

ADVANCE PAYMENT GUARANTEE No.: [Insert guarantee reference number]

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

1. We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ (in words _____) is to be made against an advance payment guarantee.
3. At the request of the Contractor, we as Guarantor, here by irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (in words _____) upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:
 - a) Has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
 - b) Has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Contractor on its account number _____ at _____.
5. The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, on the _____ day of _____, 20____, ² _____, ² whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.
6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.

[Name of Authorized Official, signature(s) and seals/stamps]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

¹The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency of the advance payment as specified in the Contract.

²Insert the expected expiration date of the Time for Completion. The Procuring Entity should note that in the event of an extension of the time for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM NO. 8 – RETENTION MONEY SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ *[Insert name and Address of Procuring Entity]*

Date: _____ *[Insert date of issue]*

Advance payment guarantee no. *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informed that _____ *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Contractor") has entered into Contract No. _____ *[insert reference number of the contract]* dated _____ with the Beneficiary, for the execution of _____ *[insert name of contract and brief description of Works]* (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys upto the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, and payment of *[insert the second half of the Retention Money]* is to be made against a Retention Money guarantee.
3. At the request of the Contractor, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* _____ *([insert amount in words _____])¹* upon receipt by us of the Beneficiary's complying demands supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified there in.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Contractor on its account number _____ at _____ *[insert name and address of Applicant's bank]*.
5. This guarantee shall expire no later than the.....Day of.....², and any demand for payment under it must be received by us at the office indicated above on or before that date.
6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months]* *[one year]*, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.

[Name of Authorized Official, signature(s) and seals/stamps]

Note: *All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.*

¹The Guarantor shall insert an amount representing the amount of the second half of the Retention Money.

²Insert a date that is twenty-eight days after the expiry of retention period after the actual completion date of the contract. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM NO. 9 BENEFICIAL OWNERSHIP DISCLOSURE FORM

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form (“Form”) is to be completed by the successful tenderer. In case of joint venture, the tenderer must submit a separate Form for each member. The beneficial ownership information to be submitted in this Form shall be current as of the date of its submission.

For the purposes of this Form, a Beneficial Owner of a Tenderer is any natural person who ultimately owns or controls the Tenderer by meeting one or more of the following conditions:

- *Directly or indirectly holding 25% or more of the shares.*
- *Directly or indirectly holding 25% or more of the voting rights.*
- *Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.*

Tender Reference No.: _____

_____ [insert identification no] Name of the

Assignment: _____ [insert name of

the assignment] to: _____ [insert complete name of Procuring Entity]

In response to your notification of award dated _____ [insert date of notification of award] to furnish additional information on beneficial ownership: [select one option as applicable and delete the options that are not applicable]

I) We here by provide the following beneficial ownership information.

Details of beneficial ownership

Identity of Beneficial Owner	Directly or indirectly holding 25% or more of the shares (Yes / No)	Directly or indirectly holding 25 % or more of the Voting Rights (Yes / No)	Directly or indirectly having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer (Yes / No)
[include full name (last, middle, first), nationality, country of residence]			

OR

ii) *We declare that there is no Beneficial Owner meeting one or more of the following conditions: directly or indirectly holding 25% or more of the shares. Directly or indirectly holding 25% or more of the voting rights. Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.*

OR

We declare that we are unable to identify any Beneficial Owner meeting one or more of the following conditions. [If this option is selected, the Tenderer shall provide explanation on why it is unable to identify any Beneficial Owner]

Directly or indirectly holding 25% or more of the shares. Directly or indirectly holding 25% or more of the voting rights.

Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer]"

Name of the Tenderer:[insert complete name of the Tenderer]_____*

*Name of the person duly authorized to sign the Tender on behalf of the Tenderer: ** [insert complete name of person duly authorized to sign the Tender]*

Title of the person signing the Tender: [insert complete title of the person signing the Tender]

Signature of the person named above: [insert signature of person whose name and capacity are shown above]

Date signed [insert date of signing] day of..... [Insert month], [insert year]

SECTION XI – TERMS OF REFERENCE

1.0 BACKGROUND INFORMATION

The Parliamentary Service Commission is established under Article 127 of the Constitution of Kenya, 2010, with the mandate to provide services and facilities for Members and staff of Parliament to efficiently and effectively fulfill its constitutional mandate in its roles of representation, oversight and legislation.

In carrying out this mandate the Parliamentary Service Commission (PSC) identified the need for capacity building for Members and staff of Parliament and resolved to establish a Centre for Parliamentary Studies and Training (CPST). The Promulgation of the Constitution of Kenya 2010 established devolved units with assemblies conducting legislative, oversight and representation roles similar to the National Parliament. This has created an increased demand for the services of the CPST. The Centre is the first of its kind within the region and therefore serves to build capacity for other regional Parliaments.

The PSC recently developed and is implementing its 3rd Strategic Plan, 2019- 2030. Under this new Strategic Plan, the PSC identifies Excellence in Service Delivery as a key strategic pillar. The development of a modern training facility at CPST is envisaged under this strategic pillar. It is against this background that the PSC seeks to procure the services of a consultant or a consortium of consultants to prepare a Master plan, Preliminary and detailed designs, tender documents; and carry out construction supervision of the proposed modern training facility for the Centre for Parliamentary Studies and Training on its five- acre land in Karen.

2.0 ENVIRONMENTAL FACTORS

2.1 NAIROBI CITY CLIMATE

Nairobi experiences a moderate climate with mainly wet and dry seasons. Nairobi’s lies at an altitude of approximately 1,680 meters above sea level with warm-hot days for most of the year. Nairobi experiences higher temperatures typically reaching a high of 30C between December to March and cooler temperatures in June/July when temperatures can fall to around 10^C. There are two rainy seasons, but rainfall can be moderate. As Nairobi is situated close to the equator, the differences between the seasons are minimal.

Climate data for Nairobi													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C	25.5	26.7	26.8	25.0	23.5	22.5	22.0	22.7	25.0	25.7	24.0	24.5	24.5
Daily mean °C	18.0	18.8	19.4	19.2	17.8	16.3	15.6	15.9	17.3	18.5	18.4	18.1	17.8
Average low °C	10.5	10.9	12.1	13.4	12.1	10.0	9.2	9.1	9.7	11.3	12.7	11.7	11.1
Average precipitation mm	58.3	49.8	92.2		189.5	38.6	17.6	24.0	31.2	60.8	149.6	107.6	1,061.5
Average precipitation days (≥ 1.0 mm)	4	4	8			5	3	4	4	7		9	90
Mean monthly sunshine hours	288.	266.0	266.	204.	189.1	159.	130.2	127.1	180.0	226.3	198.0	257.3	2,491.9
Mean daily sunshine hours	9.3	9.5	8.6	6.8	6.1	5.3	4.2	4.1	6.0	7.3	6.6	8.3	6.8

Source: BBC Weather

2.2 SITE TOPOGRAPHY

Nairobi lies at an average altitude of 1,680 meters above sea-level, but this height ranges from 1500m (to the East) to 2300m (to the West). It is located at longitude 36°50' East and Latitude 1°18' South about 140km South of the Equator and situated at an elevation of about 5,500 feet above sea level. The proposed site is generally flat, with minimal natural ground cover (trees and shrubs). The site for the proposed construction works lies within Zone 4; Karen Plains, an area that is predominantly flat, with substantial drainage problems and prone to seasonal flooding during rainy seasons.

2.3 GEOLOGY

The soils in Nairobi are products of mainly weathering and erosion of underlying volcanic rocks under relatively high temperatures, rainfall and poor drainage. As a result of impeded drainage of the plains, the soils are black to dark grey clays (Grumosolic) comprising black cotton soils with calcareous and non-calcareous variants. The proposed project will not cause physical change to the environment because of the nature of the topography, slope and stability of the soils.

2.4 EXISTING INFRASTRUCTURE

This refers to all facilities and services provided in the neighbourhood including roads, sanitation and garbage collection, water, electricity, security, sewerage facilities, schools and housing. The site is accessed via the Langata South Road off Magadi Road. There are existing waterlines, electricity powerlines and telecommunication lines along the Langata South Road. However, local council water is not reliable. The area does not have a sewer line and the development therefore provides an alternative sewerage disposal and treatment system. Other infrastructural components of sanitation, garbage collection and waste management shall be undertaken by the contractor in an environmentally sustainable manner during the construction process.

The site is characterized by trees and shrubs with no existing buildings. The site neighbourhood comprises mainly low-density residential developments, institutional and educational facilities such as Tangaza College, Catholic University of East Africa and so on, office developments etc. during the process of construction the contractor is expected to undertake works cognizant of the immediate neighbourhood requirements.

3.0 DETAILED PROJECT DESCRIPTION

3.1 The proposed building comprises an eight (8) storey building complex with one(1) basement level housing the following main functions; -

- i) Basement parking and storage facilities.
- ii) Administrative offices
- iii) Conferencing facilities; auditorium, moot parliamentary training chambers, conference rooms etc.
- iv) Indoor sporting facilities and Spa
- v) Clubhouse
- vi) Services buildings (power rooms, boiler house, gatehouse, etc.)
- vii) Gatehouse and perimeter fence
- viii) Five-star accommodation facilities
- ix) Library and research hub
- x) Swimming pool and associated works
- xi) Associated landscaping and civil works;
 - Landscaped gardens,
 - Jogging track,
 - Access roads, driveways & car parks, and;
 - Surface rain water runoff & storm water drainage.
- xii) Associated Electrical, ICT & Mechanical Services as below; -

(a) Electrical Installations

- Electrical installations and power controls (lighting and power supply, distribution and street lighting),
- Audio visual system for committee rooms/conference rooms, and centralized television aerial system,
- Data and voice (structured cabling network and Telephone),
- Time distribution and display system,
- Building management system,
- Integrated Security Management System (ISMS),
- Solar water heating and lighting (hybrid grid tie solar lighting system), and;
- Standby Generator and controls.

(b) Plumbing, Drainage and Fire-fighting Installations

- Water supply from mains and distribution,
- Plumbing and drainage,
- Waste water treatment,
- Garden irrigation system using recycled water,
- Solid waste management,
- Borehole development including treatment of borehole water,
- Rain water harvesting, treatment and distribution,
- Fire-fighting, fire detection and suppression system,
- Kitchen equipment for commercial kitchen and LPG Installation,
- Laundry and laundry equipment,

(c) Lifts Installations

- Goods and Passenger Lifts

(d) Air-conditioning and Mechanical Ventilation Installations

- Mechanical ventilation and air conditioning.

3.2 The proposed building structure

The proposed building structure for the project will comprise the following:

- (a) Sub-structure; combination of a pad and raft foundation.
- (b) Super-structure; Reinforced concrete framed structure comprising columns, beams, slabs, shear walls and composite beams (concrete and structural steel).

3.3 Proposed Building Internal and External Finishes

The general finishes to the proposed building will comprise the following:

- (a) Internal finishes;

Floor, wall and ceiling finishes will be applied. The Internal finishes will include amongst others; polished natural stone slabs, porcelain tiles, profiled gypsum ceilings and tempered glass partitions.

- (b) External finishes;

External finishes will include; laminated glass, powder coated and butt glazed aluminium framed curtain walls, alucobond cladding, and polished natural stone cladding.

NOTE: The information above is meant as a guide only. Candidates are advised not to use the information given herein when tendering for the works and to instead use the bills of quantities, specifications and the drawings to provided.

4.0 OBJECTIVES OF THE PROPOSED PROJECT

4.74. GENERAL OBJECTIVES

The key general objectives include the following:

- (a) Proper management of the cost of the project.
- (b) Proper management of project timelines to ensure the project is completed in time.
- (c) Adherence to the highest quality of materials, fittings, finishes and workmanship.
- (d) Appropriate management of the environment in accordance with the Environmental Management and Coordination Act (EMCA 1999).
- (e) Ensuring the highest level of safety and health to all parties including workers, neighbours, tenants and passersby.
- (f) Compliance to the regulations, conditions and requirements set out by the County Government and other regulatory authorities.
- (g) Ensuring the highest level of technology transfer to the local people and proper capacity building in the construction industry.
- (h) Enabling the appropriate protection of intellectual property rights of the Consultants and the Client.
- (i) Facilitating the realization of the artistic, technological, professional and commercial intentions of the Consultants and the Client.
- (j) Ensuring the use of innovative and modern construction methods.
- (k) Ensuring proper and efficient use of machinery, equipment and technology.

4.75. SPECIFIC OBJECTIVES

The site-specific objectives include the following:

- (a) Construction methods in a predominantly quiet residential zone.
- (b) Mass excavation deeper than existing neighboring building foundations.
- (c) Management of building materials, machinery, equipment, and personnel in a construction site located in a quiet and serene residential/institutional zone.
- (d) Suitable construction methodology for pad and raft foundations.
- (e) Suitable waterproofing methodology for basements, water tanks and flat slabs.
- (f) Ensuring safety of the pedestrians, motorists and property in the neighbourhood.
- (g) Suitable concreting works methodology to be used for a long spanning building in a residential/institutional neighbourhood.
- (h) Ensuring efficient delivery of building materials to site to avoid traffic congestion.
- (i) Ensuring efficient construction waste management on site.

REPUBLIC OF KENYA



PARLIAMENT
OF KENYA

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR

PARLIAMENTARY SERVICE COMMISSION
PARLIAMENTARY JOINT SERVICES

ON LR NO. 28172

TENDER REF NO PJS/012/2021-2022

BILL OF QUANTITIES

PROJECT CONSULTANTS

ARPRIM CONSULTANTS

P.O. BOX 12969-00400

NAIROBI, KENYA.

EMPLOYER

PARLIAMENTARY JOINT SERVICES

P.O. BOX 41842-00100

NAIROBI, KENYA.

TABLE OF CONTENTS

	<u>PAGE NO.</u>
A	
BILLS OF QUANTITIES	
1. Preambles, Specifications and Pricing Notes	1-28
2. Particular Preliminaries	1/1-1/12
3. General Preliminaries	2/1-2/17
4. Main Building Works	15/1
5. Club House	16/1
6. Gate House 2no.	17/1-17/38
7. Service Building	18/1-18/25
8. Boiler House	19/1-9/22
9. Boundary Wall	20/1-20/10
10. Civil Works	21/1-21/29
11. Landscaping	22/1-22/8
12. Signage and Artwork	23/1-23/6
13. Dayworks and Schedule of Rates	24/1-24/5
14. Prime Cost Sums	25/1
15. Electrical Installations	SE/1
16. Mechanical Installations	SM/1
17. Grand Summary	GS / 1

**PREAMBLES, SPECIFICATIONS AND
PRICING NOTES**

PREAMBLES AND PRICING NOTES

GENERALLY

. All work is to be carried out in accordance with the Ministry of Public Works General Specification issued in 1976 as qualified or amended below The Contractor shall maintain a copy in the PROJECT MANAGER 'S office at all times.

MANUFACTURER'S NAME and Catalogue references are given as a guide to quality only. Alternative manufacture of equal quality will be accepted at the discretion of the PROJECT MANAGER.

EXCAVATION

Prices are to include for excavating in all materials met with except Rock as specified. Prices are also to include planking and strutting and for destroying all white ants in the vicinity of the buildings.

CONCRETE WORK

All concrete shall conform to the “concrete specification for building 1974” issued by the Structural Department of the Ministry of Public Works. All reinforced concrete to be class 35,class 25,class 20,class 15 or otherwise specified Above specification and to be guaranteed strength as described.

Cover to Reinforcement: Unless otherwise specified on the drawings cover is to be:-

Foundations	50mm
Columns	40mm
Beams	25mm
Slabs	50mm

Test Cubes: Allowance must be included in the tender for the preparation of concrete test cubes as required by the PROJECT MANAGER.

Precast concrete works: Prices are to include for handling reinforcement and for bedding in cement mortar; concrete will be class 20 or otherwise specified.

WALLING

Concrete blocks; All concrete walling blocks are as described in the Ministry of Public Works Standard Specification for Metric Concrete Blocks issued in September 1972. Masonary walls to be as specified in the Bills of Quantities

Wall reinforcement shall be hoop iron one layer per 90mm thickness and placed in bed joint of alternate courses.

Samples: Prices are to include for packing and sending sample blocks to the Ministry of Public works Testing Laboratory, Nairobi.

ROOFING

All roof materials and waterproofing shall be as specified in the Bills of Quantities and laid in accordance with the Manufacturer's instructions.

CARPENTRY AND JOINERY.

Cypress: The grading rules for Cypress shall be the same as those for podocarpus.

Laminated Plastic Sheeting: Shall be fixed with and approved waterproof adhesive.

Prices of Joinery: Shall include for pencil rounded arises; for protection against damage and for bedding frames and cills in cement mortar.

Plugged: Shall mean drilling walling or concrete with a masonry drill and filling with proprietary plugs of the correct size: cutting with hammer and chisel will not be permitted.

IRONMONGERY

Shall be as specified in the Bills of Quantities, or equal and approved. Prices must include for removing and refining during and after painting, for labelling all keys, and for fixing with matching screws.

METAL WORK.

Structural Steelwork Shall comply with Ministry of Public Works "Structural Steel Specification" 1973.

- Generally: All steelwork shall be cleaned free from rust and primed one coat of red lead primer before being delivered to the site.

Prices for Metal Windows: are to include for assembling parts, bedding and pointing in mastic building in fixing lugs, and plugging as necessary.

PLASTERWORK AND OTHER FINISHES

Generally: All plasterwork and paving to be as described in the General Specification and in these Bills of Quantities.

Terrazzo Paving:- Shall be as described for granolithic paving, but using marble chippings and colour cement.

Paving:- Prices are to include for brushing concrete clean, wetting and "coating with cement and sand grout 1:1. tyrolean rendering shall be in two coats: The first coat 10mm. thick in gauged cement mortar 1:4 (with 10% lime added to the cement) applied with a trowel and the second coat in cement and sand 1:4 applied with Tyrolean spraying machine in three layers to a total thickness between 5 and 10mm.

GLAZING

Polished Plate Glass: Shall be General Glazing Quality. Prime Rebates: Prices are to include for priming rebates before placing putty. Broken or Scratched Glass: The Contractor will be responsible at his own cost, for replacing any broken or scratched glass and handing over in perfect condition.

PAINTING.

Generally:- Note that the General Contractor is to provide scaffolding for all trades including painting.

Paint Category: - Shall be category "A" of Ministry of Public Works approved list and applied in accordance with the Manufacturer's instructions.

Prices: - Prices are to include for all preparatory work priming coats and for protecting other works and for cleaning up on completion. Prices for painting on galvanized metal are to include for mordant solution as necessary.

PLUMBING:-

Generally: - All work shall be executed by an approved Sub-Contractor and in accordance with the General Specification.

Description :- The sizes given are the internal diameter . The words pipe and tube are synonymous.

Prices of pipes:- Are to include for assembling and jointing parts plugging as necessary and all joints to services and wastes or soil pipes

DRAINAGE

All work to be executed by an approved Sub-Contractor and in accordance with the General Specification.

ROADS AND CAR PARKS

All work must be supervised by an experienced Roads Engineer or Foreman.

EXTERNAL WORKS

Prices of excavation are to include for keeping excavations dry and for supporting sides.

SPECIAL SPECIFICATIONS FOR THE PROJECT

ALUCOBOND / ALUMINIUM COMPOSITE PANEL :

Nano self-cleansing aluminium composite panel composed of normal PE core, aluminium pane, primer paint, PVDF paint and finished in Nanometer paint- matt grey clour. Aluminium Panel to be 6mm thick.

GRANITO TILE SPECIFICATIONS

GRADE: Grade One. WEAR RATING: Porcelain and Enamel Institutes (PEI) Wear Rating of five (V).
WATER ABSORPTION (WA)RATE: Impervious. SLIP RESISTANCE: Coefficient of friction of grater than 0.6. PRINTING:3D Digital Print Technology.BODY COMPOSITION: Full Body. THICKNESS: Above 3/4inch (18mm and above).FINISH: Micro-crystal finish of the 'Thick Collection' glass layer of more than 3mm thick. DIMENSIONS: Rectified tiles for uniform dimensions (dimensionally stable tiles) to take a maximum of 1.5mm wide grout joints.TOLERANT DISTORTION: Below 0.5% in both right angle level and flatness straightness. Grade 1/PEI Rating of V, Water absorption rate (WA) - Impervious, Slip resistance co-efficient friction of more than 0.60, through body

GRANITE SPECIFICATIONS(LOCAL OR EQUIVALENT)

1.0 GENERAL

1.1 Related Documents

Drawings and general provisions, including General and Supplementary Conditions of the Contract and Division I Specification sections, apply to this section.

1.2 Applicable Publications

The following publications listed here and referred to thereafter by alphanumeric code designation only, form a part of this specification to the extent indicated by the references thereto:

1) ASTM International (ASTM):

C615-99 Standard Specification for Granite Dimension Stone
A666-00 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
B221-00 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
C97-02 Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
C99-87(2000) Standard Test Method for Modulus of Rupture of Dimension Stone
C119-03 Standard Terminology Relating to Dimension Stone
C170-90(1999) Standard Test Method for Compressive Strength of Dimension Stone
C241-90(1997)e1 Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic
C270-03 Standard Specification for Mortar for Unit Masonry
C295-03 Standard Guide for Petrographic Examination of Aggregates for Concrete
C880-98 Standard Test Method for Flexural Strength of Dimension Stone
C1028-96 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
C1201-91(1996) Standard Test Method for Structural Performance of Exterior Dimension Stone Cladding Systems by Uniform Static Air Pressure Difference
C1242-02a Standard Guide for Selection, Design, and Installation of Exterior Dimension Stone Anchors and Anchoring Systems
C1352-96(2002) Standard Test Method for Flexural Modulus of Elasticity of Dimension Stone
C1353-98e1 Standard Test Method Using the Taber Abraser for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic
C1354-96 Standard Test Method for Strength of Individual Stone Anchorages in Dimension Stone
C1515-01 Standard Guide for Cleaning of Exterior Dimension Stone, Vertical and Horizontal Surfaces, New or Existing
C1528-02 Standard Guide for Selection of Dimension Stone for Exterior Use

2) Marble Institute of America (MIA):

Membership, Products and Services Directory, Dimension Stone Design Manual, Dimension Stones of the World, Volumes I and II (includes color plates, ASTM test data, and other technical information). Additional publications may be available from the MIA Bookstore - go online at
_ HYPERLINK "<http://www.marble-institute.com>" __www.marble-institute.com_.

3) National Building Granite Quarries Association (NBGQA)

Specifications for Architectural Granite

1.3 Scope of Included Work

The work to be completed under this contract includes all labor and materials required for the furnishing and installation of all granite work shown or called for on the contract drawings, specifications, and addenda.

1.4 Definition of Terms

The definitions of trade terms used in this specification shall be those published by the MIA, BGQA, or ASTM International.

1.5 Source of Supply

All granite shall be obtained from quarries having adequate capacity and facilities to meet the specified requirements, and from a firm equipped to process the material promptly on order and in strict accord with specifications. The Specifying Authority (architect, designer, engineer, contracting officer, end user, etc.) reserves the right to approve the Material Supplier prior to the award of this contract. Stone and workmanship quality shall be in accordance with Industry Standards and Practices as set forth by the MIA.

1.6 Samples

The Granite Contractor shall submit through the General Contractor, for approval by the Specifying Authority, at least two full range sets of samples of the various kinds of granite specified. Sample submittals shall represent the full range of color and markings inherent in the material proposed for fabrication of the project. Full range sample sets must be reviewed and approved as a complete set and not as individual pieces. Full range sample sets shall be indicative of the true character, including any natural variation in background and foreground color, veining or graining, of the material currently available and proposed for use on the project. The sample size shall be 1'-0" x 1'-0" minimum, 2'-0" x 2'-0" minimum for heavily veined or varied stones, and shall represent approximately the finish, texture, and anticipated range of colors to be supplied. One set of approved samples shall be retained by the Specifying Authority, and one set shall be returned to the Granite Supplier for his record and guidance. It is noted herein that granite is a natural material and will have intrinsic variations in color, markings, and other characteristics. Depending on granite selected and quantity required, a range mockup may be used to further define the characteristics of the material. Cost of mockup, if required, shall not be included in this section. Prior to fabrication, and to assure the end user's needs will ultimately be met and to fully understand the finish and full range of the material, an inspection and approval by the Specifying Authority and/or General Contractor and/or End User of the material is recommended. Costs for an initial inspection of the quarried blocks before slabbing, and a second inspection of the finished material slabs before fabrication shall be stipulated and included in the overall contract requirements.

1.7 Shop Drawings

The Granite Contractor shall submit through the General Contractor, for approval by the Specifying Authority, sufficient sets of shop drawings, showing general layout, jointing, anchoring, stone thickness, and other pertinent information. These drawings shall show all bedding, bonding, jointing, setting spaces and anchoring details along with the net piece dimensions of each granite unit. Due to tight fabrication tolerances of dimensional stone (see "Dimensional Tolerances" in this section) special attention must be paid to those areas where associated trade's work abuts or is integral with the stone installation. Additional notes calling out required set backs, setting space allowances below and behind floor and wall installations, critical "hold-too" dimensions, or any other specific conditions requiring strict coordination with other trades work should be incorporated into the shop drawings. Coordination of approved shop drawings with all affected trades is the responsibility of the General Contractor. One copy of the approved shop drawings shall be retained by the Specifying Authority, one copy shall be retained by the General Contractor, and one copy returned to the Granite Contractor for fabrication. NO FABRICATION OF GRANITE SHALL BE STARTED UNTIL SUCH DRAWINGS HAVE BEEN FULLY APPROVED AND MARKED AS SUCH. The Granite Contractor shall not be responsible for determining, making, or verifying (1) design, structural, wind, seismic, or other design loads; (2) engineering estimates; (3) plans or specifications; or (4) the types, sizes, or locations of anchors, unless specifically added to the scope of work.

1.8 Defective Work

Any piece of granite showing flaws or imperfections upon receipt at the storage yard or building site shall be referred to the Specifying Authority for determination as to responsibility and decision as to whether it shall be rejected, patched, or redressed for use.

1.9 Repairing Damaged Stone

Chips at the edges or corners may be patched, provided the structural integrity of the stone is not affected and the patch matches the color and finish of the natural stone so that it does not detract from the stone's appearance.

2.0 MATERIALS

2.1 Granite

General: All granite shall be of standard architectural grade, free of cracks, seams, starts, or other traits which may impair its structural integrity or function. Inherent color variations characteristic of the quarry from which it is obtained will be acceptable. Texture and finish shall be within the range of samples approved by the Specifying Authority. ASTM C615 [C97] [C99] [C170] [C241] [C880]. See the chart of applicable ASTM standards and tests in the Appendix.

Schedule: Granite shall be provided as follows:

1) For (state location on building) (state name and color) granite with a (type) finish,

supplied by (name company or list several approved suppliers).
2) Provide information as in (1) for each different granite/finish combination in the project.
Finishes: Finishes listed in the schedule shall conform with definitions by MIA, NBGQA, or ASTM International.

2.2 Setting Mortar

Mortar for setting shall be Type N, as defined in ASTM C270-03 (Standard Specification for Mortar for Unit Masonry). All mixing, handling, and pacing procedures shall be in accordance with ASTM C270-03.

2.3 Pointing Mortar

Mortar for pointing shall be Type N, as defined in ASTM C270-03 (Standard Specification for Mortar for Unit Masonry). All mixing, handling, and pacing procedures shall be in accordance with ASTM C270-03.

2.4 Sealants and Backup Material (if applicable)

Where specified, (state type or name of sealant) shall be used for the pointing of joints. The backup material used with the sealant shall be (identify material).

2.5 Anchors, Cramps, and Dowels

All anchorage components shall be of 300 Series stainless steel (refer to ASTM A666) or aluminum (refer to ASTM B221) with strength and durability properties meeting or exceeding those of 6063-T6. Anchor types and assemblies shall comply with ASTM C1242-02a. Reliance on adhesives alone for material attachment will not be permitted. The granite contractor shall be responsible for all anchorage attached to the stone and directly related to stone installation. The granite contractor shall not be responsible for any additional support elements required for proper attachment of stone anchorage to the structure of the building.

3.0 FABRICATION

3.1 Dimensional Tolerances

Panel thickness of 3/8" or 1/2".....±1/32"
Panel thickness of 3/4" to 1-5/8"±1/8"
Panel thickness >1-5/8".....±1/4"
Panel face dimension±1/16"
Face variation from rectangular±1/16"
(maximum out of square) (noncumulative)
Heads/calibrated edges±1/16"
Quirk miters (width of nose):
Up to 1/4".....-0; +25% of dim
Over 1/4".....-0, +1/16"
Location of back anchors.....±1/8"
Depth of back anchors.....-0, +1/16"
Location of holes for precast anchors±1/4"
Hole depth for precast anchors±1/16"

Anchor Slots:
 From face to C/L of slot±1/16"
 Lateral placement.....±1/4"
 Width±1/16"
 Depth at maximum.....±1/8"
 Anchor Holes:
 From face to C/L of slot±1/16"
 Lateral placement.....±1/8"
 Diameter±1/16"
 Depth±1/8"
 Anchor Sinkages:
 Depth.....-0, +1/8"
 Continuous Kerfs:
 From face to C/L of kerf..... ±1/16"
 Maximum bow in 4'-0"..... ±1/16"
 Width..... ±1/16"
 Depth.....-1/16"; +1/8"
 Rebated Kerf:
 Elevation of bearing surface.. ±1/16"
 Bearing Checks:
 Elevation of bearing surface . ±1/16"
 Bearing/Clearance Checks:
 Lateral location ±1/2"
 Setback from face..... ±1/16"

3.1.1 Typical Unit Sizes

Tile stock- 12" x 12", 18" x 18", & 24" x 24" nominal. Thickness of tile stock is typically 3/8" thick for most polished and honed surfaces (see "6.2 Protection of Finished Work" in this section), and 1/2" thick for most thermal, or pointed finishes. Large format tile stock (18" x 18" and larger) may only be available in 1/2" thickness and is dependant on the specific stone's properties and the material supplier.

Dimension Stone Slab Stock- Industry standard slab stock available in 2 cm & 3 cm (3/4" & 1 1/4" nominal) thickness. Typical slab sizes vary by material, but average 6'-0" x 9'-0" for granite and 4'-0" x 8'-0" for marble. For specialty thicknesses or extremely large piece size requirements, the granite contractor or granite fabricator should be consulted in the design phase to assure the design intent can be met. Typical maximum finished piece size is 4'-0" x 4'-0" +/-.

3.2 Flatness Tolerances

Variation from true plane, or flat surfaces, shall be determined by a 4' dimension in any direction on the surface. Such variations on polished, honed, and fine rubbed surfaces shall not exceed tolerances listed below, or 1/3 of the specified joint width, whichever is greater. On surfaces having other finishes, the maximum variation from true plane shall not exceed the tolerance listed below, or 1/2 of the specified joint width, whichever is greater.

Flatness Tolerances by Finish.

Polished, honed, or fine rubbed.....1/16"
Sawn, 4-cut, 6-cut, and 8-cut1/8"
Thermal and coarse stippled3/16"
Pointed or other rough cut.....1"
Split face....dependent on piece size & stock

3.3 Beds and Joints

Bed and joint width shall be determined by analysis of anticipated building movements and designed to accommodate such movements without inducing undue stresses in the stone panels or joint filler materials. Expansion joints shall be designed and located to accommodate larger movements.

3.4 Backs Of Pieces

Backs of pieces shall be sawn or roughly dressed to approximately true planes. Back surfaces shall be free of any matter that may create staining

3.5 Moldings, Washes, and Drips

Moldings, washes, and drips shall be constant in profile throughout their entire length, in strict conformity with details shown on approved shop drawings. The finish quality on these surfaces shall match the finish quality of the flat surfaces on the building.

3.6 Back-Checking and Fitting to Structure or Frame

The building design should incorporate stone installation requirements such as material thickness, setting space, and anchorage allowances. Maintain a minimum of 1 1/4" between stone backs and adjacent structure and allow for all components of the building structure (waterproofing, flashing, etc). (Note: many bolted connections will require more space than this; 2" space may be more desirable. Large-scale details should illustrate and control these conditions and be distributed by the General Contractor to the affected trades.)

3.7 Cutting for Anchoring, Supporting, and Lifting Devices

Holes and linkages shall be cut in stones for all anchors, cramps, dowels, and other tieback and support devices per industry standard practice or approved shop drawings. However, additional anchor holes may be drilled at job site by Granite Contractor to facilitate alignment. No holes or linkages will be provided for Granite Contractor's handling devices unless arrangement for this service is made by the Granite Contractor with the Granite Fabricator. (NOTE: It is not recommended that Lewis pins be used for stones less than 3-1/2" thick.)

3.8 Cutting and Drilling for Other Trades

Any miscellaneous cutting and drilling of stone necessary to accommodate other trades will be done by the Granite Fabricator only when necessary information is furnished in time to be shown on the shop drawings and details, and when work can be executed before

fabrication. Cutting and fitting, due to job site conditions which are contrary to the dimensions and details shown on approved shop drawings are not the responsibility of the granite contractor and will be provided only by arrangement between the General Contractor and Granite Contractor.

3.9 Carving and Models

All carving shall be done by skilled Stone Carvers in a correct and artistic manner, in strict accordance with the spirit and intent of the approved shop drawing, or from models furnished or approved by the Specifying Authority.

4.0 SHIPPING AND HANDLING

4.1 Packing and Loading

Finished granite shall be carefully packed and loaded for shipment using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing. (See "6.2 Protection of Finished Work" in this chapter.)

4.2 Site Storage

Upon receipt at the building site, stone shall remain in the factory-prepared bundles until beginning of the installation. Bundles shall be staged in an area which is least susceptible to damage from ongoing construction activity. Once unbundled, the granite shall be stacked on timber or platforms at least 2" above the ground, and the utmost care shall be taken to prevent staining or impact damage of the granite. If storage is to be prolonged, polyethylene or other suitable, nonstaining film shall be placed between any wood and finished surfaces of the granite. Polyethylene or other suitable, nonstaining film may also be required as protective covering. Any holes or slots in the granite which are capable of collecting water shall be temporarily covered or plugged to prevent freezing of collected water. Such covers or plugs are to be removed immediately prior to installation of the piece.

5.0 INSTALLATION

5.1 General Installation

Installation shall be accomplished with competent, experienced Stone Setters, in accordance with the approved shop drawings. All granite pieces shall be identified with a unique piece number corresponding with the number on the shop drawings. Interchanging of numbered pieces is not permitted as the pieces are generally blended for color and characteristic markings by the granite fabricator. Granite shall be free of any ice or frost at time of installation. Salt shall not be used for the purpose of melting ice, frost, or snow on the granite pieces. Adequate protection measures shall be taken to ensure that exposed surfaces of the stone shall be kept free of mortar at all

times as elements in mortar may etch the polished surfaces of some stones.

5.2 Mortar Setting of Granite

Clean base materials to remove dirt or other foreign matter. Saturate concrete substrate several hours prior to setting granite. Prepare and place mortar in accordance with ASTM C270-03. Thoroughly wet stones prior to setting in mortar bed. Apply neat cement parge of approximate 1/16" thickness to granite units prior to placing on mortar bed. Tamp stones into place using a rubber or plastic mallet to obtain full contact with the setting bed and proper stone unit alignment.

5.3 Mortar Joints

Mortar joints shall be raked out to a depth of 1/2" to 3/4". Apply pointing mortar in layers not exceeding 3/8" and allow each layer to get hard to the touch before the next layer is applied. Tool finished joints with a concave tool having a diameter approximately 1/8" greater than the joint width. Care shall be taken to keep expansion joints free of mortar, which would compromise their function.

5.4 Anchorage

All granite shall be anchored in accordance with the approved shop drawings. Specific anchorage design and details shall be determined by the granite contractor in conjunction with the granite fabricator. To the furthest extent possible, all anchor preparations in granite units shall be shop applied. All anchorage devices and anchor hole/slot fillers shall be in accordance with ASTM C1242-02. Care must be taken to ensure that any holes capable of retaining water are filled after use to prevent water collection and freezing.

5.5 Sealant Joints

Where so specified, joints requiring sealant shall be first filled with a closed-cell ethafoam rope backer rod. The backer rod shall be installed to a depth that provides optimum sealant profile after tooling per manufacturer recommendations. If recommended by the Sealant Manufacturer, primers shall be applied to the substrate surfaces according to the manufacturer's directions prior to application of the joint sealant. A test should be conducted to assure that the specified sealant will not stain the stone. Typically, Sample pieces of stone with kerf cuts applied to the sample face representing the typical joint size (1/4" x 1/4", 3/8" x 3/8", 1/2" x 1/2" etc.) are filled with the specified sealant and allowed to cure for 24 to 48 hours. Any potential staining should be apparent at this point. Fully cured sealant samples will be submitted to demonstrate no staining to stone by the specified sealant.

5.6 Expansion Joints

It is not the intent of this specification to make control or expansion-joint recommendations for a specific project. The Specifying

Authority must specify control or expansion joints and show locations and details on drawings. Typically, expansion joints are required at 20'-0" intervals and should be determined by the design professional and the granite contractor.

5.7 Caulking

Where so specified, joints shall be pointed with the sealant(s) specified in Section 2.4, after first installing the specified backup material and applying a primer if required, all in strict accordance with the printed instructions of the Sealant Manufacturer. All sealants shall be tooled to ensure maximum adhesion to the contact surfaces.

5.8 Weep Tubes

Plastic or other weep tubes shall be placed in joints where moisture may accumulate within the wall, such as at base of cavity, continuous angles, flashing, etc., or as shown on architectural drawings.

5.9 Installation Tolerances

The quality of the stone installation relies greatly on the quality and accuracy of those trades preceding stone installation. After review and approval, shop drawings shall be distributed and coordinated by the General Contractor to all trades whose work abuts, or is integral with the stone installation.

Variation in plumb:

Lines and surfaces of walls and columns:

..... ¼" in 10'-0"
..... NTE 3/8" in story height

..... ½" in 40'-0"

Exterior corners or other conspicuous lines:

..... ¼" in 10'-0"
..... NTE 1/4" in story height

..... ½" in 40'-0"

Variation from level:

Lintels, parapets, rustications:

..... ½" in column bay
..... ¾" in 40'-0"

Variation from linear building line:

½" in column bay ¾" in 40'-0"

6.0 CLEANING AND PROTECTION

6.1 Cleaning

All cleaning methods shall be tested on material samples prior to application to the stone installation to assure there are no adverse affects of the cleaning method or products to the stone surface. Granite shall be cleaned after installation and all pointing or caulking is complete. All dirt, excess mortar, weld splatter, stains, and other defacements shall be removed. All cleaning methods shall be in accordance with ASTM C1515-01.

6.2 Protection of Finished Work

Granite installation in progress shall be protected with film or fabric tarps secured over the work as required. After the granite is installed, it shall be the responsibility of the General Contractor to properly and adequately protect it from damage until all trades are finished. This responsibility includes the stone cleaning costs prior to the required final inspection. Where lumber is required for protection, care should be taken to protect the granite from staining by the lumber, using plastic film or other suitable materials. Any fasteners used in construction of temporary protection fixtures shall be noncorrosive.

Impact-resultant finishes, such as bush hammered (sometimes referred to as a pointed finish), require a 1¼" thick slab minimum to apply. Other finishes can usually be applied to any thickness slab, with the exception of some granites not being able to withstand thermal finishing processes in thicknesses less than 1¼". Determination of proper stone thickness must be evaluated using the following criteria:

- 1) Piece Size.
- 2) Final Face Finish.
- 3) Anchoring Detail.
- 4) Structural Design Load Requirements.
- 5) Flexural Strength of the Granite.

Minimum safety factors of 3 to 1 minimum on granite flexural stresses and 4 to 1 minimum on anchorage components in granite are recommended. Ashlar or veneer used as a facing requires a setting space of at least 1 1/4", as measured from the nominal thickness of the piece to the outermost layer of the building structure (including any required waterproofing, flashing, etc.).

Bed and Joint Width. The minimum recommended bed and joint width is 1/4" for exteriors and 1/8" for interiors due to the relatively tight fabrication and installation tolerances of dimension stone (see "3.1 Dimensional Tolerances" & "5.9 Installation Tolerances" in this section.), but not less than 2 times the specified tolerances for the particular application.

Sawn Backs. Because of physical characteristics, most granites cannot be split to a thickness less than 1/3 of the lesser face dimension. Consequently, sawn backs (see 3.4 in this chapter) should be specified for most veneers, and are frequently specified also for thicker ashlar, because of design considerations.

Staining. Granite should be protected from wet (green) wood, oils, mud, construction waste, and asphalt compounds. Contact Fabricator or Granite Contractor for proper remedies to staining problems that occur.

MARBLE SPECIFICATIONS

1.0 GENERAL

1.1 Related Documents

Drawings and general provisions, including General and Supplementary Conditions of the Contract and Division I Specification sections, apply to this section.

1.2 Applicable Publications

The following publications listed here and referred to thereafter by alphanumeric code designation only, form a part of this specification to the extent indicated by the references thereto:

1) ASTM International (ASTM):

C503-99e1 Standard Specification for Marble Dimension Stone (Exterior)

C97-02 Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

C99-87(2000) Standard Test Method for Modulus of Rupture of Dimension Stone

C170-90(1999) Standard Test Method for Compressive Strength of Dimension Stone

C241-90(1997) Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic

C880-98 Standard Test Method for Flexural Strength of Dimension Stone

2) Marble Institute of America (MIA):

Membership, Products, and Services Directory, Dimension Stone Design Manual, Dimension Stones of the World, Volumes I and II (includes color plates, ASTM test data, and other technical information).

Additional publications may be available from the MIA Bookstore-go online at

_ HYPERLINK "<http://www.marble-institute.com>" __www.marble-institute.com_.

1.3 Scope of Included Work

The work to be completed under this contract includes all labor and materials required for the furnishing and installation of all marble work shown or called for on the contract drawings, specifications, and addenda.

1.4 Definition of Terms

The definitions of trade terms used in this specification shall be those published by the MIA or ASTM International.

1.5 Source of Supply

All marble shall be obtained from quarries having adequate capacity and facilities to meet the specified requirements and by a firm equipped to process the material promptly on order and in strict accord with specifications. The Specifying Authority (architect, designer, engineer, contracting officer, end user etc.) reserves the right to approve the Material Supplier prior to the award of this contract. Stone and workmanship quality shall be in accordance with Industry Standards and Practices as set forth by the MIA.

1.6 Samples

The Marble Contractor shall submit through the General Contractor, for approval by the

Specifying Authority, at least two full range sets of samples of the various kinds of marble specified. Sample submittals shall represent the full range of color and markings inherent in the material proposed for fabrication of the project. Full range sample sets must be reviewed and approved as a complete set and not as individual pieces. Full range sample sets shall be indicative of the true character, including any natural variation in background and foreground color, veining or graining, of the material currently available and proposed for use on the project. The sample size shall be 1'-0" x 1'-0"

minimum, 2'-0" x 2'-0" minimum for heavily veined or varied stones, and shall represent approximately the finish, texture, and anticipated range of color to be supplied. Where necessary to show variations in color and markings, larger samples or range sets of samples should be submitted. If marble is to be matched, a minimum of two sets each containing four matched samples showing proposed veining and range of color in each set must be supplied. Samples designating finished face shall be clearly labeled on the back with the name of the marble, the group classification for soundness, and the use for which the marble is intended. One set of samples shall be retained by the Specifying Authority, and

one set shall be returned to the Marble Supplier for his/her record and guidance. It is noted herein that marble is a natural material and will have intrinsic variations in color, markings, and other characteristics. Depending on the marble selected and quantity required, a range mockup may be

used to further define the characteristics of the material. Cost of mockup, if required, shall not be included in this section. Prior to fabrication, and to assure the end user's needs will ultimately be met and to fully understand the finish and full range of the material, an inspection and

approval by the Specifying Authority and/or General Contractor and/or End User of the material is recommended. Costs for an initial inspection of the quarried blocks before slabbing, and a second inspection of the finished material slabs before fabrication shall be stipulated and included in the overall contract requirements.

1.7 Shop Drawings

The Marble Contractor shall submit through the General Contractor, for approval by the

Specifying Authority, sufficient sets of shop drawings showing general layout, jointing,

anchoring, stone thickness, required setting spaces and such other pertinent information. These drawings shall show all bedding, bonding, jointing, and anchoring details along with the net piece dimensions of each marble unit. Due to tight fabrication tolerances of dimensional stone (see "Dimensional Tolerances" in this section) special attention must be paid to those areas where associated trade's work abuts or is integral with the stone installation. Additional notes calling out

required set backs, setting space allowances below and behind floor and wall installations, critical "hold-too" dimensions, or any other specific conditions requiring strict coordination with other trades work should be incorporated into the shop drawings. Coordination of approved shop drawings with all affected trades is the responsibility of the General Contractor. One copy of approved drawings shall be retained by the Specifying Authority, one copy shall be retained by the General Contractor, and one copy returned to the Marble Contractor for fabrication. NO FABRICATION OF MARBLE SHALL BE STARTED UNTIL SUCH DRAWINGS HAVE BEEN FULLY APPROVED AND MARKED AS SUCH. The General Contractor shall furnish all field dimensions necessary for fabrication. If measurements are not established and guaranteed in advance, the Marble Contractor shall obtain and verify measurements at the building. The General Contractor shall be responsible for all reasonable assistance to the Marble Contractor, including the services of an Engineer, if required, for the establishment of levels, bench marks, and the like. The Marble Contractor shall not be responsible for determining, making, or verifying (1) design, structural, wind, seismic, or other design loads; (2) engineering estimates; (3) plans or specifications; or (4) the types, sizes, or locations of anchors, unless specifically added to the scope of work.

1.8 Defective Work

Any piece of marble showing flaws or imperfections upon receipt at the storage yard or building site shall be referred to the Specifying Authority for determination as to responsibility and decision as to whether it shall be rejected, patched, or redressed for use.

1.9 Repairing Damaged Stone

Small chips at the edges or corners of marble may be patched provided the structural integrity of the stone is not affected and the patch matches the color and finish of the marble so that the patch does not detract from the stone's appearance. More extensive repairs may be required for certain Class C & D marbles and are acceptable pending above stipulations.

2.0 MATERIALS

2.1 Marble

General: All marble shall be of kind or kinds shown on the Architect's drawing or as specified herein, conforming to or within the range of approved samples and in accordance with the characteristics and working qualities set forth under their respective Soundness Group Classifications, A, B, C, or D, as defined by the Marble Institute of America. Some Class C & D marbles, while prized for their vibrant colors and bold veining, are more apt to require patching and repair due to the physical limitations of these highly veined materials. Care shall be taken in selection to produce as harmonious effects as possible. Patching and waxing, where permitted under the Marble Institute of America Group Classifications, shall be carefully done to conform to the marble's general character and finish. Texture and finish shall be within the range of sample(s) approved by the Specifying Authority. ASTM C503 [C97] [C99] [C170] [C241] [C880].

See the chart of applicable ASTM standards and tests in the Appendix.
Schedule: Marble shall be provided as follows:

1) For (state location on building) (state name and color) marble with a (type) finish, supplied by (name company or list several approved suppliers). 2) Provide information as in (1) for each different marble/finish combination in the project.

Finishes: Finishes listed in the schedule shall conform with definitions by MIA or ASTM International.

Polish finish: A mirror like, glossy surface which brings out the full color and character of the marble. This finish is not recommended for exterior or commercial floor use.

Honed finish: A velvety smooth surface with little or no gloss.

Abrasive finish: A flat, nonglossy surface usually recommended for exterior use.

2.2 Setting Mortar (and Adhesives)

All proposed setting materials shall be tested by the Marble Contractor to assure that there is no staining to the specified stone. Light colored and green marbles are typically more susceptible to staining and require additional consideration to avoid damage to stone during installation.

Portland cement shall conform to the requirements of the Standard Specifications for Portland Cement, ASTM C150-02a. White Portland cement is recommended for white or light-colored marble. Nonstaining cement shall conform to the requirements of the Standard Specifications for Masonry Cement, ASTM C91-03. Molding plaster (plaster of Paris) shall conform to the requirements of the Standard Specifications for Gypsum Molding Plaster, ASTM C59/C59M-00.

Sand. All sand shall be clean, free from organic and other deleterious matter likely to stain the finished work, and shall be screened as required for the desired results.

Portland cement shrinkage-reducing accelerator used with Portland cement to

give it the quick-setting characteristics of plaster of Paris, shall be a nonstaining admixture that will not corrode anchors or dowels.

Nonstaining adhesive shall be of a type that will not stain the marble, that is not affected by temperature changes or moisture, and that adheres with strong suction to all clean surfaces.

2.3 Pointing Mortar

Mortar for pointing shall be Type N, as defined in ASTM C270-03 (Standard Specification for Mortar for Unit Masonry). All mixing, handling, and pacing procedures shall be in accordance with ASTM C270-03.

2.4 Sealants and Backup Material (if applicable)

Where specified (state type or name of sealant) shall be used for the pointing of joints. The

backup material used with the sealant shall be (identify material).

Sealants, used for pointing to exclude moisture and provide a joint that will remain plastic for many years, shall be nonstaining.

2.5 Anchors, Cramps, and Dowels

Anchors, cramps, and dowels shall be made of corrosion-resistant metals. Special cramps, dowels, and the like shall be used where shown on shop drawings, but elsewhere, #8 copper or stainless steel wire anchors shall be used. It shall be the responsibility of the Marble Contractor to anchor all marble securely. For standing marble, the following practices usually prevail:

A minimum of four anchors should be provided for pieces up to 12 square feet, with two additional anchors for each additional 8 square feet of surface area. Shims used to maintain joints shall be plastic. Use of copper wire for anchors to be installed over 12' off the ground is not recommended.

3.0 FABRICATION

3.1 Dimensional Tolerances

Panel thickness of 3/8" or 1/2"..... $\pm 1/32$ "
Panel thickness of 3/4" to 1-5/8" $\pm 1/8$ "
Panel thickness >1-5/8"..... $\pm 1/4$ "
Panel face dimension $\pm 1/16$ "
Face variation from rectangular $\pm 1/16$ "
(maximum out of square) (noncumulative)
Heads/calibrated edges $\pm 1/16$ "
Quirk miters (width of nose):
Up to 1/4".....-0; +25% of dim
Over 1/4".....-0, +1/16"
Location of back anchors..... $\pm 1/8$ "
Depth of back anchors.....-0, +1/16"
Location of holes for precast anchors. $\pm 1/4$ "
Hole depth for precast anchors..... $\pm 1/16$ "
Anchor Slots:
From face to C/L of slot $\pm 1/16$ "
Lateral placement..... $\pm 1/4$ "
Width..... $\pm 1/16$ "
Depth at maximum..... $\pm 1/8$ "
Anchor Holes:
From face to C/L of slot $\pm 1/16$ "
Lateral placement..... $\pm 1/8$ "
Diameter $\pm 1/16$ "
Depth $\pm 1/8$ "
Anchor Sinkages:
Depth.....-0, +1/8"
Continuous Kerfs:
From face to C/L of kerf..... $\pm 1/16$ "
Maximum bow in 4'-0"..... $\pm 1/16$ "
Width..... $\pm 1/16$ "
Depth.....-1/16"; +1/8"
Rebated Kerf:
Elevation of bearing surface.. $\pm 1/16$ "
Bearing Checks:
Elevation of bearing surface . $\pm 1/16$ "
Bearing/Clearance Checks:

Lateral location $\pm 1/2$ "
Setback from face..... $\pm 1/16$ "

3.1.1 Typical Unit Sizes

Tile stock- 12" x 12", 16" x 16", & 18" x 18" nominal. Thickness of tile stock is typically 3/8" thick for most polished and honed surfaces. Large format tile stock (16" x 16" and larger) may only be available in 1/2" thickness and is dependant on the specific stone's properties and the material supplier.

Dimension Stone Slab Stock- Industry standard slab stock available in 2 cm & 3 cm (3/4" & 1 1/4" nominal) thickness. Typical slab sizes vary by material, but average 4'-0" x 8'-0" for marble. For specialty thicknesses or extremely large piece size requirements, the Marble Contractor should be consulted in the design phase to assure the design intent can be met. Typical maximum finished piece size is 3'-0" x 3'-0" +/-.

3.2 Flatness Tolerances

Variation from true plane, or flat surfaces, shall be determined by a 4' dimension in any direction on the surface. Such variations on polished, honed, and fine rubbed surfaces shall not exceed tolerances listed below, or 1/3 of the specified joint width, whichever is greater. On surfaces having other finishes, the maximum variation from true plane shall not exceed the tolerance listed below, or 1/2 of the specified joint width, whichever is greater.

Flatness Tolerances by Finish.

Polished, honed, or fine rubbed.....1/16"
Sawn, 4-cut, 6-cut, and 8-cut1/8"
Thermal and coarse stippled3/16"
Pointed or other rough cut1"
Split face....dependent on piece size & stock

3.3 Beds and Joints

Bed and joint width shall be determined by analysis of anticipated building movements and designed to accommodate such movements without inducing undue stresses in the stone panels or joint filler materials. Expansion joints shall be designed and located to accommodate larger movements.

3.4 Backs Of Pieces

Backs of pieces shall be sawn or roughly dressed to approximately true planes. Back surfaces shall be free of any matter that may create staining.

3.5 Moldings, Washes, and Drips

Moldings, washes, and drips shall be constant in profile throughout their entire length, in strict conformity with details shown on approved shop drawings. The finish quality on these surfaces shall match the finish quality of the flat surfaces on the building.

3.6 Back-Checking and Fitting to Structure or Frame

The building design should incorporate stone installation requirements such as material thickness, setting space, and anchorage allowances. Maintain a minimum of 1 1/4" between stone backs and adjacent structure and allow for all components of the building structure (waterproofing, flashing, etc). (Note: many bolted connections will require more space than this; 2" space may be more desirable. Large-scale details should illustrate and control these conditions and be distributed by the General Contractor to the affected trades.)

3.7 Cutting for Anchoring, Supporting, and Lifting Devices

Holes and linkages shall be cut in stones for all anchors, cramps, dowels, and other tieback and support devices per industry standard practice or approved shop drawings. However, additional anchor holes may be drilled at job site by Marble Contractor to facilitate alignment. No holes or linkages will be provided for Marble Contractor's handling devices unless arrangement for this service is made by the Marble Contractor with the Marble Fabricator. (NOTE: It is not recommended that Lewis pins be used for stones less than 3-1/2" thick.)

3.8 Cutting and Drilling for Other Trades

Any miscellaneous cutting and drilling of stone necessary to accommodate other trades will be done by the Granite Fabricator only when necessary information is furnished in time to be shown on the shop drawings and details, and when work can be executed before fabrication. Cutting and fitting, due to job site conditions which are contrary to the dimensions and details shown on approved shop drawings are not the responsibility of the Marble Contractor and will be provided only by arrangement between the General Contractor and Marble Contractor.

3.9 Carving and Models

All carving shall be done by skilled Stone Carvers in a correct and artistic manner, in strict accordance with the spirit and intent of the approved shop drawing, or from models furnished or approved by the Specifying Authority.

4.0 SHIPPING AND HANDLING

4.1 Packing and Loading

Finished marble shall be carefully packed and loaded for shipment using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing.

4.2 Site Storage

It shall be the responsibility of the Marble Contractor to receive, store, and protect the marble from damage by others after it is delivered to the job site and prior to its erection in the building. All marble shall be received and unloaded at the site with care in handling to avoid damage or soiling. If marble is stored outside, it shall be covered with nonstaining waterproof paper, clean canvas, or polyethylene.

5.0 INSTALLATION

5.1 General Installation

Installation shall be accomplished with competent, experienced Stone Setters, in accordance with the approved shop drawings. All marble pieces shall be identified with a unique piece number corresponding with the number on the shop drawings. Interchanging of numbered pieces is not permitted as the pieces are generally blended for color and characteristic markings by the Marble Fabricator. Marble shall be free of any ice or frost at time of installation. Salt shall not be used for the purpose of melting ice, frost, or snow on the stone pieces. Adequate protection measures shall be taken to ensure that exposed surfaces of the stone shall be kept free of mortar at all times as elements in mortar may etch the polished surfaces of some stones. All setting materials shall be tested on the specified stone to assure there is no staining.

5.2 Mortar Setting of Marble

A. Floor Marble

Floor Preparation. It is the General Contractor's responsibility to clean all sub floor surfaces to remove dirt, dust, debris, and loose particles immediately prior to setting marble floor and to ensure that the area to receive the stone flooring meets the deflection standards of the industry.

Curing Compounds. Curing compounds of any kind shall not be used on the slab on which floor marble is to be directly set. If a curing compound is present, it is the General Contractor's responsibility to remove it by scarifying the slab. Before being set, all marble shall be clean and

free of foreign matter of any kind.

Cement Bed. The cement bed to receive the marble tile shall consist of 1 part Portland

Cement to not more than 3 to 5 parts of clean, sharp sand mixed quite dry for tamping. White Portland cement is recommended for light-colored marbles.

Marble Tamped. The marble shall be tamped with a suitable mallet until firmly bedded to the proper level of the floor.

Marble Removed. The marble shall then be removed and the back parged with wet cement or the bed sprinkled with water and cement. In the latter procedure, the back of the marble shall be wet. The method of fully buttering edges of the marble as it is laid is equally approved.

Joints. Joints between the marble pieces shall show an even width when laid and finished.

Traffic After Installation. The floor shall be roped off for 24 hours after installation and then grouted with water and white Portland cement grout or nonstaining dry-set Portland cement grout.

Time-Line for Additional Cleaning.

Cleaning or additional surfacing, if required, shall not be undertaken until the new floor is at least seven days old.

Thin-Set Method. The thin-set method of installing marble tile employing the use of dry-set Portland cement mortars is recommended for thin marble tiles (nominal 3/8" thick) where optimum setting space is not available. Sub floor shall be clean, smooth finished, and level.

Stone dust must be washed off the back face of stone pavers prior to installation. Apply mortar with flat side of trowel over an area that can be covered with tile while mortar remains plastic. Within ten minutes, and using a notched trowel sized to facilitate the proper coverage, comb mortar to obtain an even-setting bed without scraping the backing material. Key the mortar into the substrate with the flat side of the trowel. Comb with the notched side of the trowel in one direction. Firmly press stone tiles into the mortar and move them perpendicularly across the ridges, forward and back approximately 1/8" to 1/4" to flatten the ridges and fill the valleys. Ensure a maximum mortar thickness of 3/32" between stone tile and backing after stone tile has been tamped into place. Stone tile shall not be applied to skinned-over mortar. Alternatively, back butter the stone tiles to ensure 100% contact. In either method, ensure 100% contact on 3/8" tile; not less than 80% contact on 3/4" or thicker material, noting that all corners and edges of stone tiles must always be fully supported, and contact shall always be 100% in exterior and/or water-susceptible conditions.

B. Interior Veneer Marble

The marble shall be set by spotting with gypsum molding plaster or cement mortar and the use of concealed anchors secured in the wall backing. Special consideration may be required for penetrations to fire rated walls.

C. Marble Wall Tile

Individually set thin tile (nominal 3/8" thick) on vertical surfaces exceeding 8' is not recommended. Where thin marble tile is installed, nonstaining adhesives or dry-set mortars may be used as setting beds.

D. Toilet and Shower Compartments

Stiles and partitions shall be assembled with concealed dowel fastenings or corrosion resistant angles, three in height of stall. For ceiling-hung units, metal supporting members in ceiling are to be furnished and installed by the General Contractor.

5.3 Mortar Joints

Mortar joints shall be raked out to a depth of $\frac{1}{2}$ " to $\frac{3}{4}$ ". Apply pointing mortar in layers not exceeding $\frac{3}{8}$ " and allow each layer to get hard to the touch before the next layer is applied. Tool finished joints with a concave tool having a diameter approximately $\frac{1}{8}$ " greater than the joint width. Care shall be taken to keep expansion joints free of mortar, which would compromise their function.

5.4 Anchorage

All marble shall be anchored or doweled in accordance with the approved shop drawings. To the furthest extent possible, all anchor preparations in the marble units shall be shop applied. All anchorage devices and anchor hole/slot fillers shall be in accordance with ASTM C1242-02. Care must be taken to ensure that any holes capable of retaining water are filled after use to prevent water collection and freezing.

5.5 Sealant Joints

Where so specified, joints requiring sealant shall be first filled with a closed-cell ethafoam rope backer rod. The backer rod shall be installed to a depth that provides optimum sealant profile after tooling per manufacturer recommendations. If recommended by the Sealant Manufacturer, primers shall be applied to the substrate surfaces according to the manufacturer's directions prior to application of the joint sealant. A test should be conducted to assure that the specified sealant will not stain the stone. Typically, Sample pieces of stone with kerf cuts applied to the sample face representing the typical joint size ($\frac{1}{4}$ " x $\frac{1}{4}$ ", $\frac{3}{8}$ " x $\frac{3}{8}$ ", $\frac{1}{2}$ " x $\frac{1}{2}$ " etc.) are filled with the specified sealant and allowed to cure for 24 to 48 hours. Any potential staining should be apparent at this point. Fully cured sealant samples will be submitted to demonstrate no staining to stone by the specified sealant.

5.6 Expansion Joints

It is not the intent of this specification to make control or expansion-joint recommendations for a specific project. The Specifying Authority must specify control or expansion joints and show locations and details on drawings. Typically, expansion joints are required at 20'-0" intervals and should be determined by the design professional and the Marble Contractor.

5.7 Caulking

Where so specified, joints shall be pointed with the sealant(s) specified in Section 2.4, after first installing the specified backup material and applying a primer if required, all in strict accordance with the printed instructions of the Sealant Manufacturer. All sealants shall be tooled to ensure maximum adhesion to the contact surfaces.

5.8 Weep Tubes

Plastic or other weep tubes shall be placed in joints where moisture may accumulate within the wall, such as at base of cavity, continuous angles, flashing, etc., or as shown on architectural drawings.

5.9 Installation Tolerances

The quality of the stone installation relies greatly on the quality and accuracy of those trades preceding stone installation. After review and approval, shop drawings shall be distributed and coordinated by the General Contractor to all trades whose work abuts, or is integral with the stone installation.

Variation in plumb:

Lines and surfaces of walls and columns:
..... $\frac{1}{4}$ " in 10'-0"
..... NTE $\frac{3}{8}$ " in story height

..... $\frac{1}{2}$ " in 40'-0"
Exterior corners or other conspicuous lines:

..... $\frac{1}{4}$ " in 10'-0"
..... NTE $\frac{1}{4}$ " in story height
..... $\frac{1}{2}$ " in 40'-0"

Variation from level:

Lintels, parapets, rustications:
..... $\frac{1}{2}$ " in column bay
..... $\frac{3}{4}$ " in 40'-0"

Variation from linear building line:

$\frac{1}{2}$ " in column bay
..... $\frac{3}{4}$ " in 40'-0"

6.0 CLEANING AND PROTECTION

6.1 Cleaning

All cleaning methods shall be tested on material samples prior to application to the stone installation to assure there are no adverse affects of the cleaning method or products to the stone surface. Marble shall be cleaned after installation and all pointing or caulking is complete. All dirt, excess mortar, weld splatter, stains, and other defacements shall be removed. All cleaning methods shall be in accordance with ASTM C1515-01.

Marble Contractor should be contacted before cleaners other than neutral detergents are used.

6.2 Protection of Finished Work

After the marble work is installed, it shall be the responsibility of the General Contractor to see that it is properly and adequately protected from damage or stains until all trades are finished. This responsibility includes the stone cleaning costs prior to the required final inspection. The Marble

Contractor will outline the needs for protection, in writing, to the General Contractor. For the protection of projecting members, corners, window stools, and saddles, wood guards using lumber that will not stain or deface with marble shall be supplied, installed, and maintained by the General Contractor. All nails used shall be

galvanized or nonrusting. Damage to finished marble by other trades shall be repaired or replaced at the expense of the General Contractor. Marble flooring shall be adequately protected by the General Contractor against traffic and other damage with nonstaining materials, without cost to the Marble Contractor. All marble work in progress shall be protected at all times during construction by use of a strong, impervious film or fabric securely held in place as required.

PRICING NOTES

SPECIAL NOTES TO BE READ PRIOR TO PRICING THESE BILLS OF QUANTITIES

1. The Tenderer shall tender for the above Works in accordance with the drawings, Specifications and Bills of Quantities.
2. The Tenderer is required to check the numbers of the pages of these Specifications and Bills of Quantities against the index and should he find any missing, in duplicate or indistinct he must inform the Employer at once and have the same rectified.
3. Should the Tenderer be in doubt about the precise meaning of any item or figures, for any reason whatsoever, he must inform the Employer at once in order that the correct meaning may be decided before the date for submission of the tenders.
4. No liability will be admitted or claim allowed in respect of errors in the Tenderer's Tender due to mistakes in the Specifications which should have been rectified in the manner described above.
5. The annexed Bills of Quantities must be fully priced in ink. The Tenderer shall not alter or otherwise qualify the text of these Specifications and Bills of Quantities Any alteration or qualification made without authority will be ignored and the text of the Bills of Quantities as printed will be adhered to.
6. The Tenderer shall be deemed to have made allowance in his prices generally to cover items of Preliminaries or additions to Prime Cost Sums or other items, if the Tenderer has not priced these where appropriate.
7. All items of measured work shall be priced in detail and tenders containing Lump Sums to cover trades or groups of work must be broken down to show prices of each item before they will be accepted. Lump Sums to cover items of Preliminaries shall be likewise broken down if so required.
8. In no case will any expense incurred by Tenderers in preparation of this Tender be allowed.
9. The copyright of these Specifications and Bills of Quantities is vested in the Quantity Surveyors and no part thereof may be reproduced without their express permission given in writing.
10. The Tenderer is solely responsible for the accurate ordering of materials in accordance with the Drawings and Architect's instructions and no claim for any loss or expense will be entertained for orders for materials based upon the Bills of Quantities
11. If it is found on the examination of a Tender that there are arithmetical errors, then the difference between the Tender and the corrected total shall be applied as a percentage adjustment of addition or omission on all the builder's rates so that the original Tender Amount remains unaltered. When calculating the percentage adjustment, the total cost of the Preliminaries, Provisional and P.C. sums, Contingencies and any other items of a similar nature shall be excluded.
12. **ALL RATES SHALL BE DEEMED TO INCLUDE ALL GOVERNMENT TAXES AND IN PARTICULAR VALUE ADDED TAX (V.A.T). ANY SEPARATE CLAIMS ON TAXES WILL NOT BE ALLOWED.**
13. The Bills of Quantities must be priced in Kenya currency i.e. shillings and cents.

PARTICULAR PRELIMINARIES

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
PARTICULAR PRELIMINARIES					
	PARTIES				
A	The "EMPLOYER" is PARLIAMENTARY JOINT SERVICES PROTECTION HOUSE P.O. BOX 41842 - 00100, NAIROBI EMAIL : dg@parliament.go.ke				
B	The "PROJECT MANAGER" ARPRIM CONSULTANTS P.O. BOX 12969 - 00400, NAIROBI TEL: 020 - 884312/8 EMAIL : info@arprimconsultants.com				
C	The "PROJECT ARCHITECT" ARPRIM CONSULTANTS P.O. BOX 12969 - 00400, NAIROBI TEL: 020 - 884312/8 EMAIL : info@arprimconsultants.com				
D	The "PROJECT QUANTITY SURVEYOR" ARPRIM CONSULTANTS P.O. BOX 12969 - 00400, NAIROBI TEL: 020 - 884312/8 EMAIL : info@arprimconsultants.com				
E	The "PROJECT STRUCTURAL AND CIVIL ENGINEER" ARPRIM CONSULTANTS P.O. BOX 12969 - 00400, NAIROBI TEL: 020 - 884312/8 EMAIL : info@arprimconsultants.com				
F	The "PROJECT SERVICES ENGINEER" ARPRIM CONSULTANTS P.O. BOX 12969 - 00400, NAIROBI TEL: 020 - 884312/8 EMAIL : info@arprimconsultants.com				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>PRICING ITEMS OF PRELIMINARIES</p> <p>Prices SHALL BE INSTERTED against Items of "Preliminaries" in the tenderer's priced Bills of Quantities. Where no price is inserted the Contractor shall be deemed to have included in his prices or rates for the various items in the Bills of Quantities or Specification for all such costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract. The contractor is advised to read and understand all preliminary items.</p>				
B	<p>DESCRIPTION OF THE WORKS</p> <p>The building on reinforced concrete raft, strip and/or bases foundations, columns, beams, suspended slabs staircase and a lift shaft including solid concrete block & stone walls plastered and painted.</p> <p>Roofs are waterproofed reinforced concrete slabs with concrete tiles and a parapet wall.</p> <p>All external doors are glazed aluminium, windows are in aluminium, curtain walling.</p> <p>All internal doors are flush solid/semi solid core with veneered finish and mahogany panelled doors,glazed aluminium</p> <p>All partitions are powder coated aluminum with laminated glass</p> <p>Floor finishes are in granite slab,marble slab, granito tiles, porcelain, carpet ,carpet tiles, etc</p> <p>Ceilings are in suspended acoustic tiles on T-profiled aluminium sections hang on, gypsum and some areas plaster and paintwork</p> <p>Balustrading and railing are stainless steel railing</p> <p>Kitchen cabinets are in veneered MDF blockboard</p> <p>External works are site clearance & preparatory works, roads and parking areas in cobble stones , footpaths in PCC slabs, stormwater drainage, foul water drainage, water reticulation, electrical reticulation and soft landscaping.</p> <p>Electrical works include supply and installation of all electric fittings in accordance with engineer's directions.</p>				
C	<p>FLOOR AREAS</p> <p>The total built up area is approximate 42,900 Square Metres approximately. The total gross floor area is given without warranty but for guidance only.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
B	<p>MEASUREMENTS</p> <p>In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT MANAGER in accordance with Clause 22 of the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with Clause 22 of the said Conditions.</p>				
C	<p>LOCATION OF SITE</p> <p>The site of the proposed works is situated along Lang'ata South Road in Karen. Those submitting tenders may visit the site and obtain more information from the procurement office before submission of their bids.</p> <p>The Contractor shall be deemed to have verified for themselves following:-</p> <ul style="list-style-type: none"> (a) The nature of the site (b) The amount of clearing and cutting and fillings and therefore ready with the right equipment. (c) The nature of existing communication by road or otherwise. (d) The availability of land for the erection and positioning of all temporary structures, plant and materials necessary for the execution of the works. <p>No claim will be allowed for travelling or other expenses, which may be incurred by the contractor in visiting the site or preparing the tender for the works.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	LABOUR CAMPS				
	<p>The contractor shall be allowed to house labour on site to the approval of the Project Architect . The contractor to make arrangements to transport additional labour not housed on site to and from site on a daily basis.</p>				
B	OFFICES, STORES AND SHEDS				
	<p>The contractor shall set up to the approval of the Architect a Ample temporary watertight sheds in the premise for his own use and the use of the sub-contractors for the proper storage and protection of materials vulnerable to theft,weather remove when ordered.</p>				
C	TEMPORARY STRUCTURES				
	<p>The contractor shall allow for providing and clearing away on completion of the works such temporary hoarding , rubbish chutes, gates, planked walkways, guard rails etc. as may be necessary for the protection of the workers, the general public, and for the proper execution of the works. As such, temporary structures shall be constructed with the approval of the Architect and to his full satisfaction and in such a manner as to cause minimum inciveness and disturbance to occupants of adjacent building, entry and exit to the existing building and users of the adjacent roads. All such temporary structures shall comply in all aspects with the national laws, rules, and regulations currently in force and applicable to such structures. All temporary structures shall be erected in a manner that the unloading of materials causes minimum obstruction to the use of adjacent roads and other facilities All temporary structures shall be kept properly lighted throughout the periods of darkness and any corners or projections shall be painted white. Temporary structures shall not be used or permitted to be used for advertisement purposes except with the consent of the Architect</p> <p>All temporary structures shall be maintained at all times in good order and good condition to the satisfaction of the Architect</p> <p>All temporary structures shall be removed when so required by the Architect or at the end of the period for which it is required</p> <p>The Contractor shall indemnify and shall keep the employer indemnified against any expenses, loss, claim or suits arising out of or in connection with the temporary structures. The Contractor shall pay all local authority or other charges payable in connection with temporary structures</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>CLAIMS</p> <p>It shall be a condition of this contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and/or expenses due to any of the contract conditions, or by any other reason whatsoever, he shall present such claimor intent to claim notice to the PROJECT MANAGER within the contract period. No claims shall be entertained upon the expiry of the said contract period.</p>				
B	<p>TEMPORARY HOARDING AND CATCHMENTS SHUTTERING AROUND WORKING AREAS</p> <p>Temporary hoarding shall be provided all around the site. The tenderers amount for hoarding shall be deemed to be inclusive of all legally demandable fees for the temporary hoarding by the Local and Central Authorities. The layout and details of the hoarding has been attached and shall include the following:-</p> <ol style="list-style-type: none"> 1. The hoarding shall be overall 3000mm high constructed in new prepainted gauge 28 galvanised box profile IT5 sheets mounted on steel framing and adequately supported by steel props, bearers and brackets at appropriate centres with 1500mm street shed roof on both sides finished with prepainted gauge 25 galvanised box profile IT5 roofing sheets on steel support including gutters, downpipes, protection road Kerbs, bollards all to the entire satisfaction and approval of the Architect and Structural Engineers.(approximately 568 L.M @.....) Vehicular and pedestrian gates shall be provided. 2. Provide a complete covered walkway and road shed finished with prepainted gauge 28 galvanised box profile IT5 roofing sheets on steel support including gutters, downpipes, kerbs and bollards and street lighting(approximately 600 S.M @.....) 3. The external surfaces of the hoarding will be primed and painted with undercoat and one finishing coat gloss oil plant. 4. Advertisements on the hoarding will only be allowed with the express approval of the Architect. <p>The Contractor shall allow for thoroughly maintaining the hoarding and gates throughout the contract and clearing away and making good disturbed ground on completion. All materials arising will remain the property of the Contractor and he should allow credit against this.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	TELEPHONE				
	<p>The contractor shall provide a telephone facilities (fixed or mobile) on site throughout the duration of the contract for use by the project manager. He shall also maintain the phone in permanent working condition and pay all charges for the duration of the Contract.</p>				
B	WATCHING, LIGHTING AND CCTV				
	<p>The Contractor shall provide at his own risk and cost all watching as necessary to safeguard the works, plants and materials against damage and theft.</p>				
C	TEMPORARY DISPOSAL OF RAIN WATER				
	<p>The Contractor shall provide and maintain all necessary temporary gutters, downpipes, chutes, drains etc. for conveying rainwater from the buildings.</p>				
	<p>The Contractor shall allow for temporary drainage plumbing and piping for keeping the premises and site free from accumulation of water.</p>				
	<p>The Contractor shall allow for draining flood water out of the site</p>				
D	PROJECT SITE OFFICE				
	<p>The Contractor shall provide through hiring or Constructing a site office where directed on site and as designed by the Architect. He shall maintain the temporary office for the sole use of the Employer, Consultants, Clerk of Works and himself. He shall provide, erect and maintain a western type water closet for the sole use of the above users, including making temporary connections to drain where applicable to the satisfaction of the Government and Medical Officers of Health and shall pay all conservancy charges and keep both office and closet in a clean and sanitary condition and dismantle and make good disturbed surfaces to the satisfaction of the Architect on completion of the works. The office and closet shall be completed before the Contractor is permitted to commence the Works. (Approximate area of the office space 300 square metres) - as per attached drawing</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>SITE OFFICE FURNITURE</p> <p>Provide a provisional sum of Kenya shillings Five million for Complete set of 20 pax Conference table and 20 No. matching conference chairs, 2No 1.8 x 1.8m L shaped desk with drawers, 20No Visitor chairs, 4No 1.0m x 0.6m x1.8m high wall cabinet shelves with lockable storage</p> <p>Allow for Contractor's profits and overheads (.....%)</p>				
B	<p>SITE OFFICE COMPUTERS, CAMERA AND PRINTERS</p> <p>Provide a provisional sum of Kenya shillings five million five hundred thousand for the purchase, maintenance and operationalization of the Consultants and clerk of works office.</p> <p>This shall include computers, laptops, UPS, site measurement tools, Site Camera, photocopying machines, A0 Plotters, printers, necessary office equipment and safety gear to the run the project successfully for the project period of 48 months.</p> <p>Allow for Contractor's profits and overheads (.....%)</p>				
C	<p>PROJECT SUPERVISION EXPENSES</p> <p>The Contractor is required to make provisions to the satisfaction of the Project Manager for the following items</p> <p>Provide a provisional sum of Kenya shillings eight million six hundred forty thousand only for 6 no project management staff @ 30,000/=each for 48 months.</p> <p>Allow for Contractor's profits and overheads (.....%)</p>				
D	<p>CLERK OF WORKS EXPENSES</p> <p>The Contractor is required to make provisions to the satisfaction of the Project Manager for the following items</p> <p>Provide a provisional sum of Kenya shillings eight million one hundred sixty thousand for clerk of works expenses @ 170,000/=each for 48 months.</p> <p>Allow for Contractor's profits and overheads (.....%)</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p><u>PROJECT VEHICLES: 2NO.</u></p> <p>The Contractor shall price for supply and provision of Two (2No.) Brand New Toyota Prado 4 x 4 from an approved car dealer together with a licensed competent driver for use and to the satisfaction of the PROJECT MANAGER' all in accordance with the notes and specifications below:-</p> <p>The Contractor shall ensure that the vehicles comply with the all government regulatory requirements in force such as licenses, comprehensively insured, and serviced regularly in accordance with the manufacturer's instructions and maintained in good condition throughout the entire contract period so that the vehicles are available for use in good serviceable condition at all times.</p> <p>In the event of the vehicles being unserviceable when required, the contractor shall provide alternative vehicles of the same model or other equal and approved in compliance with the provisions of this condition.</p> <p>In the event of the drivers being unavailable for whatever reason, the contractor shall provide alternative and equal qualified drivers.</p> <p>The vehicles shall be privately registered and the log books handed over to the Project Manager for safe keeping. After the contract is over the owner ship of the vehicles shall revert to the Parliamentary Service Commission</p> <p>The rates shall include for the provision of driver, fuels, lubricants and tyres, all maintenance, minor and major repairs including those occasioned by accidental damage from whatever cause arising and everything necessary to satisfy fully the requirements of this conditions.</p> <p>Prior to handing over the vehicles to the Parliamentary Service Commission at the end of the contract, the Engine Chassis and body work of the vehicle shall be re-conditioned to be as new and no excessive wear or use shall be obvious.</p> <p>The vehicle shall be given a final check by the Mechanical and Transport Engineer (M & T.E) Department of Roads, Transport, Public Works and Utilities; certificate of roads worthiness shall then be issued to the 'PROJECT MANAGER' for approval prior to acceptance of the vehicle by the Department of Roads Transport, Public Works and Utilities - Directorate of Public Works</p> <p>Reimbursement to the contractor for providing regular servicing fuels,oils,lubricants and tyres will be monthly based on actual kilometres travelled at a rate to be inserted here below To be priced in next page.</p> <p>Carried to Collection</p>				
				Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	Allow for providing 1no. 4x4 Brand New Toyota Prado including charges thereof in connection with, inspection, licensing and registration				
B	Allow for providing a comprehensive insurance as described per year for 4no. years @ Ksh Per year for each of the vehicle				
C	Allow for providing one competent driver as described per calendar month 48no. calendar months @ Kshper month				
D	Allow for providing regular maintenance,lubricants,spare and tyres for the first 200,000 km @ Ksh.....per km for each vehicle				
E	Extra over rate (D) above for the distance travelled in excess of 100,000 km @ Ksh..... per km for 50,000 km for each vehicle				
F	Allow for fitting of five (5No) New tyres at the end of the contract. The old tyres shall remain the property of the contractor.				
G	Allow for final inspection by the Mechanical and Transport Engineer (M & T.E) Department of Roads, Transport, Public Works and Utilities for issuance of road worthiness for each vehicle				
H	Allow for change in registration and transfer to employer for each vehicle				
	Sub-total				
	No. of vehicles				2
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>CONTRACTOR'S SUPERINTENDENCE/ SITE AGENT</p> <p>The Contractor shall constantly keep on the works a literate English fluent speaking Agent or Representative, competent and experienced in the kind of work involved, who shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor, directions and instructions from the Architect and such directions and instructions shall be deemed to be given to the Contractor in accordance with conditions of Contract. The Agent shall not be replaced without the specific approval of the Architect.</p>				
B	<p>COMPLIANCE TO COVID-19 PROTOCOLS</p> <p>Pursuant to the guidelines issued by the Ministry of Health the Contractor shall ensure that all necessary measures with regards to prevention, detection and containment of the Covid-19 virus are in place on site throughout the entire construction period. These include, but not limited to, provision of hand washing points with soap and water or approved anti-bacterial hand sanitizers, requirement for the use of masks, social distancing as far as is possible etc.</p>				
C	<p>SUFFICIENCY OF TENDER</p> <p>The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and the rates and the prices stated in the Bills of Quantities. Rates and prices quoted shall cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the Works.</p>				
D	<p>BID SECURITY</p> <p>The tenderer shall provide a Bid Security as prescribed in the Invitation to Tenderers</p>				
E	<p>URGENCY OF THE WORKS</p> <p>The Contractor is notified that these “Works are Urgent” and should be completed within the period state in these Particular Preliminaries.</p> <p>The Contractor shall allow in his rates for any costs he deems that he/she may incur by having to complete the works within the stipulated contract period.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p><u>PARTICULAR INSERTIONS TO BE MADE IN APPENDIX TO CONTRACT AGREEMENT</u></p> <p>The following are the insertions to be made in the appendix to the Contract Agreement:-</p> <ol style="list-style-type: none"> 1. Period of Final measurements - Three (3) Months from Practical Completion 2. Defects liability Period - Twelve (12) Months from Practical Completion 3. Date for Possession - To be agreed with Project Manager 4. Liquidated and Ascertained Damages - As per special conditions of contract 5. Period of Honouring certificates -Thirty (30) Days 6. Percentage of Certificate value retained - 10% 7. Limit of Retention Fund - 5% of Contract Sum 8. Performance Security to be-10% of Contract Sum 				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	Section No. 1				
	PARTICULAR PRELIMINARIES				
	<u>SECTION SUMMARY- PARTICULAR PRELIMINARIES</u>				
	Total Brought Forward from Page No.		Page No.		
			1/1		
			1/2		
			1/3		
			1/4		
			1/5		
			1/6		
			1/7		
			1/8		
			1/9		
			1/10		
			1/11		
	Carried to Grand Summary			Ksh	
	Section No. 1				
	PARTICULAR PRELIMINARIES				

GENERAL PRELIMINARIES

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p style="text-align: center;">GENERAL PRELIMINARIES</p> <p>ABBREVIATIONS</p> <p>A Throughout these Bills, units of measurement and terms are abbreviated and shall be interpreted as follows:-</p> <p>m³/C.M. Shall mean cubic metre m²/S.M. Shall mean square metre m/L.M. Shall mean linear metre mm/MM Shall mean Millimetre Kg. Shall mean Kilogramme No. Shall mean Number Prs. Shall mean Pairs B.S. Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.1 England.</p> <p>Ditto: Shall mean the whole of the preceding description except as qualified in the description in which it occurs.</p> <p>m.s. Shall mean measured separately. a.b.d Shall mean as before described. P.M. Shall mean Project Manager</p> <p>B EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT</p> <p>Attendance ; Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:-</p> <p>Attendance on Nominated Sub-Contractors shall be given as an iteming each case shall be deemed to include: allowing use of standing scaffolding, mess rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary; providing space for office accommodation and for storage of plant and materials; providing light and water for their work: clearing away rubbish; unloading checking and hoisting: providing electric power and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub- Contractors' work and being responsible for the accuracy of the same.</p> <p>Fix Only:-</p> <p>"Fix Only" shall mean take delivery at nearest railway station (Unless otherwise stated),pay all demurrage charges, load and transport to site where necessary, unload, store, unpack, assemble as necessary, distribute to position, hoist and fix only.</p> <p>Carried to Collection</p>			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>FORM OF CONTRACT</p> <p>The Form of Contract shall be as stipulated in the Republic of Kenya's Standard Tender Document for Procurement of Building Works (2000 Edition) included herein. These are numbered from 1 to 37 as set out in pages 18 to 42 of these tender documents.</p> <p>Particulars of insertions to be made in the Appendix to the Contract Agreement will be found in the Particular Preliminaries part of these Bills of Quantities</p>				
B	<p>STAMP DUTY CHARGES</p> <p>The Contractor shall allow for the payment of all stamp duty charges in connection with the Performance Bond and Contract Agreement.</p>				
C	<p>SITE LEVELS</p> <p>Before commencing work the Contractor must arrange for and agree with the Architect, Engineer and Quantity Surveyor the existing site levels and similarly establish and agree on a bench mark.</p>				
D	<p>SETTING OUT</p> <p>The contractor shall set out works in accordance with the dimensions and levels shown on the drawings and shall be responsible of the correctness of all dimensions and levels set out by him and he will be required to amend all errors arising from inaccurate setting out at his own cost and expenses. In the event of any error or discrepancy in the dimensions or levels marked on the drawings being discovered, such errors or discrepancies must be reported by the contractor to the architect for his immediate attention.</p> <p>No work shall be commenced by the contractor until he has received written instructions from the Architect to adjust such discrepancies which may be proved, upon receipt of such instructions and no claim for extra expenses or relief from the provisions of the Conditions of the Contract , any discrepancy or error in the dimensions or levels shown on the drawings may be made thereafter.</p> <p>Before any work is commenced by Sub-Contractors or specialist firms, dimensions must be checked on the site and/or building and agreed with the Contractor irrespective of the comparable dimensions shown on the drawings. The Contractor shall be responsible for the accuracy of such dimensions.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>SAMPLES</p> <p>The contractor shall furnish at the earliest possible opportunity before work commences and at his own cost any samples of materials or workmanship that may be called for by the Project Manager for his approval or rejection. The project manager may reject any materials or workmanship not in his opinion to be up to approved samples. The contractor shall furnish at the earliest possible. the work to which they apply. The Contractor shall ensure their protection against theft, loss or damage.</p>				
B	<p>EXISTING PROPERTY AND ADJACENT PROPERTY</p> <p>The contractor shall take every precaution to avoid damage to all existing and adjacent property including buildings, roads, cables, drains and other services and he will be held responsible for all damages hereto arising from the execution of his contract and he shall make good all such damages when directed at his own expense to the satisfaction of the Architect.</p>				
C	<p>EXISTING SERVICES</p> <p>Prior to commencement of any work the contractor is to ascertain from the relevant Authorities the exact position, depth and level of all existing electric cables, water pipes and all other services in the area and he shall make whatever provisions may be required by the authorities concerned for the support and protection of such services. Any damage or disturbances caused to any service shall be reported immediately to the Architect and the relevant Authority and shall be made good to their satisfaction at the contractor's expense.</p> <p>Through temporary interference with existing sewer or any drains, whether for the purpose of diverting, lifting, laying or making connections, the Contractor shall at his own expense provide timber troughs, pipes or other channels and if required, pumping appliances for maintaining the flow through the respective diversions.</p> <p>Where removal or disconnection of such service lines is required to be carried out under the Contract, the operations must be carried out in co-ordination with the relevant Local Service Authority so as to minimize any disruption of services to the surrounding buildings and to enable them not make any precautions necessary and to make any alternative arrangement for the temporary provision of the services affected.</p> <p>The Contractor will further be required to provide at his own cost any temporary service lines or connections for the duration of disruption caused by such disconnections or removal.</p> <p>The Contractor to allow for relocation of existing services that may be required.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p>The Contractor shall be held responsible for and shall indemnify the Employer against all losses and expenses incurred as a result of such damage and disruption of services.</p> <p>A MATERIALS, TOOLS, PLANT AND SCAFFOLDINGS</p> <p>All materials and workmanship used in the execution of the works shall be of the best quality and description. Any materials for the works condemned by the Architect shall immediately be removed from the site at the Contractor's expense.</p> <p>All materials and workmanship shall unless otherwise specified or described conform to the appropriate British Standards Institution specification current at the date of tender</p> <p>The works throughout shall be executed by skilled workmen well versed in their respective trades.</p> <p>The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are on site when required for use in the works. The Bills of Quantities shall not be used for the purpose of ordering materials.</p> <p>The contractor shall be responsible for the provision of all materials, hoists, Tower cranes, tackle, plant, vehicles, tools and appliances scaffolding, transport and workmen required for the works except in so far as may be stated otherwise herein and he shall allow for the provision of the foregoing</p> <p>The contractor shall provide, erect and maintain all temporary scaffolding, sufficiently strong and efficient for the due performance of the Works including Sub-Contractors works, provide special scaffolding as required by the Sub-Contractors, alter and adapt all scaffolding as and when required during the works and remove on completion and make good.</p> <p>No timber used for scaffolding, formwork or similar purpose shall be used afterwards in the permanent works.</p> <p>The Contractor shall allow for all costs related to hoisting his or his Sub-Contractor's materials for fixing at any level within the limits shown on the drawings or included in the general description of the works.</p> <p>All such plant, tools and scaffolding shall comply with all regulations whether general or local in force throughout the period of the contract and shall be required as may be necessary to comply with any amendments in or additions to such regulations</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>SIGN FOR MATERIALS SUPPLIED.</p> <p>The Contractor will be required to sign a receipt for all articles and materials supplied by the PROJECT MANAGER at the time of taking deliver thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacements of any such loss or damage with articles and/or materials which will be supplied by the PROJECT MANAGER at the current market prices including Customs Duty and V.A.T., all at the Contractor's own cost and expense, to the satisfaction of the PROJECT MANAGER</p>				
B	<p>LOCAL REGULATIONS AND BY-LAWS</p> <p>The contractor is to comply with all local regulations and by-laws of the Local Authority including serving notices and paying of fees.</p> <p>In addition to complying with the Factories act (Cap 514) and the Factories Amendment act (1990), the contractor shall comply in all aspects with the above mentioned rules.</p> <p>The contractor will be held responsible for serving on the chief inspector of factories a written notice not later than seven days after the beginning of the building operations included in this contract stating the particulars required.</p>				
C	<p>GOVERNMENT ACTS AND REGULATIONS, STATUTORY LEVIES</p> <p>The contractor is to comply with all government acts and regulations including serving notices and paying of fees. The tender price must include for all costs arising or resulting from compliance with any Act, Order or Regulation. such as Standard Levy, Capacity Building Levy under Public Procurement and Disposal Act and all costs arising or resulting from any Law requiring payment by the Contractor of any Statutory Levy or Levies currently in force</p> <p>The Contractor shall be required to indemnify the Employer for any claims arising out of non- compliance with the above requirements.</p>				
D	<p>TRANSPORT TO AND FROM THE SITE</p> <p>The contractor shall include in his prices for the transport of materials, workmen etc to and from the site of the proposed works at such hours and by such routes as are permitted by the Authorities.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>SECURITY OF WORKS</p> <p>The contractor shall be entirely responsible and shall pay security of all works, stores, materials, plant, personnel etc both his own and sub-contractors and shall also provide all necessary watching, lighting, and other precautions as necessary to ensure the security, the safety and protection of the public.</p>				
B	<p>PUBLIC, PRIVATE ROADS AND PAVEMENTS ETC</p> <p>The contractor will be required to make good at his own expense any damages he may cause to the present approach road surfaces, pavements, paths, storm water channels, fences etc during the period of the works to the satisfaction of the Local and other competent Authority and the Architect.</p>				
C	<p>POLICE REGULATIONS AND TRAFFIC</p> <p>The contractor is to allow for complying with all Government Acts, orders or regulations in connection with employment of labour and other matters related to the execution of the works.</p> <p>The contractor must acquaint himself duly with current acts and regulations, including police regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc..</p> <p>It is most important that the Contractor, before tendering, shall obtain from the relevant Authority the fullest information regarding all such regulations and/or restrictions which may affect the organization of the works, supply and control of labour, etc and allow accordingly in his tender.</p> <p>The Contractor will be required to agree the access route to the site with the Employer and relevant statutory authorities before commencement of the Contract Works and must adhere to this route throughout the course of the Contract, unless agreed otherwise.</p> <p>The Contractor will also be required to observe certain traffic rules and regulations pertaining to the use by his vehicles of the roads adjacent to the site. These rules and regulations should be investigated by him at the commencement of the Contract.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>PERFORMANCE BOND</p> <p>The Contractor shall find and submit the name of one surety who shall be an approved Kenyan Bank and who will be bound to: PARLIAMENTARY SERVICE COMMISSION in an amount equal to Ten per cent (10%) of the Contract amount for the due performances of the Contract up to the date of completion as certified by the Architect and who will when and if called upon sign a Bond to that effect without the addition of any limitations.</p>				
B	<p>AREA TO BE OCCUPIED BY CONTRACTOR</p> <p>The area of the site which may be occupied by the contractor for use as storage and for the purpose of erecting workshops etc shall be defined on the site by the Architect and the Contractor must confine his activities to the areas so marked and must ensure that his own and his subcontractors workmen do not trespass on the adjoining property.</p>				
C	<p>PROGRESS SCHEDULE / PROGRAMME OF WORKS</p> <p>The Contractor shall furnish to the Architect within 14 days of the possession of site a Time progress Chart for approval and display in the site offices showing the time and order in which he proposes to carry out the works within the total construction time stated in the contract. The chart will show in detail the construction time and order in which each section of the work is to be carried out and be sub-divided into trades and tasks. If the contractor proposes sectional completion of the project he must plan this in detail including access roads, and services and this shall be reflected on the chart</p>				
D	<p>WATER FOR THE WORKS</p> <p>The contractor shall provide at his own risk and cost all water for use in connection with the works including the work of sub-contractors and shall make arrangements with the local authority or water suppliers for the installation of a separate meter for all water used by him throughout the contract and pay all costs and fees in connection therewith. He shall also provide temporary storage tanks and tubing etc as he may consider necessary and clear away at completion or when no longer required.</p> <p>All water shall be fresh, clean and pure, free from earthly vegetable or organic matter, acid or alkaline substance in solution or suspension and shall be tested whenever required by the Architect.</p> <p>No claims for lack of water or water pressure will however be entertained.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>LIGHTING AND POWER</p> <p>The contractor shall provide at his own risk and cost all temporary artificial lighting and power for use on the works including all sub-contractors and specialists requirements and including all temporary connections, wiring, fittings etc and clearing away on completion. The Contractor shall pay all fees, bills and obtain all permits in connection therewith without charge to subcontractors.</p> <p>No claims due to lack of electricity or due to power fluctuations will be accepted</p>				
B	<p>MATERIAL TEST</p> <p>Allow for testing all installations required to be tested and provide everything necessary for this purpose and leave in perfect working order to the satisfaction of the Architect and Local Authority.</p> <p>Allow for all expenses in connection with testing of materials as specified hereunder including the supply and preparation of materials and their packing and conveyance to an approved Materials Testing Laboratory, Laboratory charges, etc. The following tests will be measured according to the number of tests actually called for by the Architect and carried out but unsuccessful tests will not be included in the measurement.</p> <p>Set of twenty 150 x 150 x 150mm concrete test cubes 30 sets (Provisional @ Kshs. ____ /- each set)* *Contractor to insert rate and extend</p>				
C	<p>ACCESS TO SITE AND TEMPORARY ROADS</p> <p>Means of access to the site shall be agreed with the Architect prior to commencement of the works and the Contractor must allow for building and maintaining any temporary access roads for the transport of materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossings, bridges or any other means of gaining access.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p>The Contractor must also allow for keeping the existing Public Highways and Roads clean and for making good all damage to the satisfaction of the Architect and relevant Authorities.</p> <p>Upon the completion the works the Contractor shall remove such temporary roads, temporary culverts bridges etc and make good and reinstate all works and services disturbed to the satisfaction of the Architect.</p>				
A	<p>SANITATION OF THE WORKS</p> <p>The sanitation of the works shall be provided, maintained and removed on completion by the Contractor to the satisfaction of the Architects, health department and local Authorities.</p> <p>The sanitation shall be for the use by Contractors and sub-Contractors workmen etc without charge.</p> <p>The Latrine/toilet shall be enclosed plastered and painted masonry wall, corrugated sheets roofs ,with concrete tiled floors to facilitate washing. Their location shall be agreed with the Architects and the works shall not be commenced before the sanitary accommodation has been approved by the above mentioned authorities.</p> <p>The Contractor will be required to pay all conservancy charges and shall ensure clean daily maintenance and disinfecting of the latrines/toilet, and not less than once per week, the whole area shall be sprayed with disinfectant and insecticides and any temporary drains shall be removed and all works and surfaces disturbed made good and then the whole area disinfected and left clean and free from pollution to the satisfaction of the Architect and local authorities.</p>				
B	<p>SAFETY, HEALTH AND WELFARE OF WORKERS</p> <p>The Contractor shall allow for providing for the safety, health and welfare of work people and for complying with any relevant Ordinances, Regulations or Union Agreement</p> <p>In addition to complying with the requirements of the Occupational Safety & Health Act 2007 and the Factories Act, the Contractor and Sub-Contractors shall be required to comply in all respects with the Factories (Building Operations and Work of Engineering Construction) rules together with the Construction Safety Plan in compliance with International Labour Organizations (ILO) Regulations.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p>The Contractor will further be required to identify a Site Safety Officer in accordance with the above Rules who will be responsible for the health and safety of workers on the site.</p> <p>The Contractor will also be required to provide approved good quality hard hats, gumboots and other necessary protective gear for all workers on site including Sub-Contractors workers and also for the exclusive use by the Clerk of Works and representatives of the Employer and Consultants.</p> <p>The Tenderers attention is drawn to the fact that the Employer reserves the right to hold back the amount priced against this Clause either in full or in part due to any non-performance on the Contractors part of his obligations under this Clause.</p> <p>The tenderers attention is further drawn to the fact that he is required to submit with his tender a detailed write-up on how he intends to implement the above Construction Safety Plan. It should be noted that this write-up will form a heavily weighted criteria in the evaluation of the tenders.</p> <p>Adequate temporary Notices and Signs shall be posted to indicate e.g. that building operations are in progress and entry is at ones own risk or trespassers are liable to be prosecuted or such other Notices and Signs as the Architect may consider necessary from time to time. The design and location of such signs will be to the approval of the Architect.</p>				
A	SIGN BOARD				
	<p>The Contractor shall provide and erect where directed and maintain during the whole period of the building operation and remove at completion one approved temporary notice board to the Architect's standard design giving a brief description of the works and showing the names of the employer, Contractor and the consultants, with sufficient space to append the names of the sub-contractors and suppliers when known. The lettering concerning the Architect, Quantity Surveyor and Engineer is not to be more than 50mm high.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>PROTECTION OF THE WORK</p> <p>The Contractor shall cover up and protect from damage, including damage from inclement rainy weather, all finished work contained in these Bills of Quantities, and unfixed materials including that of Sub-Contractors liable to damage including provision of casing up, temporary roof, gutters, drains etc until the completion of the works and removal of the same when no longer required and make good any damage which may nevertheless have been done at completion free of charge to the Employer.</p>				
B	<p>PREVENTION OF DISTURBANCE AND NUISANCE</p> <p>Tenderers should note that normal activities shall be continuing in the surrounding buildings during the construction period.</p> <p>Minimum disturbance by noise, dust, water or movement of vehicles, materials, labour or plant must be caused to the function of the existing adjacent buildings in the vicinity and the occupants and staff therein. The Contractor shall comply with all instructions issued by the Employer or Architect with regard to minimizing such disturbances.</p> <p>The Contractor shall not directly or indirectly or otherwise by himself or through his agents cause nuisance. Should he do so he shall be directly responsible for such acts.</p>				
C	<p>INSURANCE</p> <p>The Contractor shall insure as required in Conditions No. 30 of the Conditions of Contract and as per Section IV the Appendix to Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the Architect either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing Insurance Clauses have been complied with in all respects.</p> <p>Thereafter the Architect shall from time to time ascertain premiums are duly paid up by the Contractor who shall if called upon to do so, produce the receipted premium renewals for the Architect inspection.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p>Some of the insurances required include but not limited to:</p> <ol style="list-style-type: none"> 1. Insurance for the Works 2. Insurance for Third Party 3. Insurance for Contractor's employees and workmen 4. Insurance against loss or damage of Plant, Machinery and Equipment 5. Provide full insurance for adjacent property. <p>Notwithstanding the above, the Contractor shall specifically take insurance for the full value of the following adjacent buildings</p> <ol style="list-style-type: none"> a) Adjacent Labs <p>Provide insurance for personal injury or death insurance.</p> <p>The Contractor shall further indemnify the Employer against all claims arising out of the execution of the Contract Works.</p>				
A	<p>CLEANING, REMOVAL OF PLANT AND RUBBISH ETC</p> <p>The Contractor shall upon completion of the works remove and clear away all temporary buildings, scaffolding, plant, rubbish and unused materials, surplus excavated materials and shall leave the whole of the site of the works in a clean and tidy state to the satisfaction of the Architect, including clearing away and making good all traces of dirt.</p>				
B	<p>WORKS TO BE DELIVERED UP CLEAN</p> <p>Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole the buildings watertight, clean, perfect and fit for occupation to the approval of the Architect.</p>				
	Carried to Collection			Ksh	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>TRAINING LEVY</p> <p>The Contractor's attention is drawn to legal notice No. 237 of October 1971 which requires payment by the Contractor for a training levy on all contracts. The Contractor is required to familiarize himself with this law and allow in the preliminaries for all costs arising or resulting therefrom.</p>				
B	<p>VISIT SITE AND EXAMINE DRAWINGS.</p> <p>The Contractor is recommended to examine the drawings and visit the site the location of which is described in the Particular Preliminaries hereof.</p> <p>He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which, may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.</p>				
C	<p>SUPERVISION AND WORKING HOURS</p> <p>The works shall be executed under the direction and to the entire satisfaction in all respects of the PROJECT MANAGER who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and sub-Contractors or other places where work is being prepared for the contract.</p>				
D	<p>PROVISIONAL SUMS.</p> <p>The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(i) of the Standard Method of Measurement mentioned in Condition No.16 of the Conditions of Contract. Such sums are net and no addition shall be made to them for profit.</p>				
E	<p>PRIME COST (OR P.C.) SUMS.</p> <p>The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the Standard Method of Measurement mentioned in Condition No. 16 of the Conditions of Contract.</p> <p>Persons or firms nominated by the PROJECT MANAGER to execute work or to provide and fix materials or goods as stated in Condition No. 20 of the Conditions of Contract are described herein as Nominated Sub-Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p><u>ADJUSTMENT OF P.C. SUMS.</u></p> <p>In the final account all P.C. Sums shall be deducted and the amount properly expended upon the PROJECT MANAGER'S order in respect of each of them added to the Contract sum. The Contractor shall produce to the PROJECT MANAGER such quotations, invoices or bills, properly receipted, as may be necessary to show the actual details of the sums paid by the Contractor.</p> <p>Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" (as previously described) following P.C. Sums shall be adjusted pro-rata to the physical extent of the work executed (not pro-rata to the amount paid) and this shall apply even though the Contractor's priced Bill shows a percentage in the rate column in respect of them.</p> <p>Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in these Bill of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a Nominated Sub-Contractor.</p>				
B	<p><u>ADJUSTMENT OF PROVISIONAL SUMS.</u></p> <p>In the final account all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such work shall be valued as described for Variations in Conditions No. 13 of the Conditions of Contract, but should any part of the work be executed by a Nominated Sub-Contractor, the value of such work or articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.</p>				
C	<p><u>PROGRESS CHART.</u></p> <p>The Contractor shall provide within two weeks of Possession of Site and in agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Sub-Contractors; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on Site. Progress to be recorded and chart to be amended as necessary as the work proceeds.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>NOMINATED SUB-CONTRACTORS</p> <p>When any work is ordered by the PROJECT MANAGER to be executed by nominated sub-contractors, the Contractor shall enter into sub-contracts as described in Condition No. 8 of the Conditions of Contract and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractors any or all of the facilities described in these Preliminaries. The Contractor should price for these with the nominated Sub-contract Contractor's work concerned in the P.C. Sums under the description "add for Attendance".</p>				
B	<p>DIRECT CONTRACTS</p> <p>Notwithstanding the foregoing conditions, the County Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.</p>				
C	<p>ATTENDANCE UPON OTHER TRADESMEN, ETC.</p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Contract every facility for carrying out their work and also for use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these Bills.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p>ALTERATIONS TO BILLS, PRICING, ETC.</p> <p>Any unauthorized alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted.</p>				
B	<p>BLASTING OPERATIONS</p> <p>Blasting will only be allowed with the express permission of the PROJECT MANAGER in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being, and any special regulations laid down by the PROJECT MANAGER governing the use and storage of explosives.</p>				
C	<p>MATERIALS ARISING FROM EXCAVATIONS</p> <p>Materials of any kind obtained from the excavations shall be the property of the Government. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the PROJECT MANAGER. Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.</p>				
D	<p>GENERAL SPECIFICATION.</p> <p>For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads and Public Works and Housing General Specification dated 1976 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.</p>				
	<p>Carried to Collection</p>			<p>Ksh</p>	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	Section No. 2				
	GENERAL PRELIMINARIES				
	<u>SECTION SUMMARY- GENERAL PRELIMINARIES</u>				
	Total Brought Forward from Page No.		Page No.		
			2/1		
			2/2		
			2/3		
			2/4		
			2/5		
			2/6		
			2/7		
			2/8		
			2/9		
			2/10		
			2/11		
			2/12		
			2/13		
			2/14		
			2/15		
			2/16		
	Carried to Grand Summary			Ksh	
	Section No. 2				
	GENERAL PRELIMINARIES				

MAIN BUILDING WORKS

CONFERENCE, ADMINISTRATION & ACCOMMODATION

Note:

1. The rates and prices shall be inclusive of VAT at 16%

BASEMENT (ALL PROVISIONAL)

Note:

1. The rates and prices shall be inclusive of VAT at 16%

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 3</u>				
	<u>BASEMENT</u> <u>(All Provisional)</u>				
	<u>ELEMENT NO 1</u>				
	<u>EXCAVATION AND CONCRETE WORKS</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	7,300		
	<u>Cut down trees including grubbing roots and removing from site, as described</u>				
B	Cut down trees between 300 - 600mm girth, grub up their roots and cart away arisings	No	4		
C	Ditto 600 - 900mm girth ditto	No	5		
D	Ditto 900 - 1200mm girth ditto	No	4		
E	Ditto 1200 - 1500mm girth ditto	No	5		
F	Ditto 1500 - 1800mm girth ditto	No	7		
	<u>EXCAVATION AND EARTH WORKS</u>				
G	Excavate oversite soil average 150 mm deep and cart away from site	m2	7,300		
	Bulk excavation; starting from reduced level:-				
H	Not exceeding 1.5m deep	m3	9,700		
I	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	9,700		
J	Exceeding 3.0 m but not exceeding 4.5 m deep	m3	9,700		
K	Exceeding 4.5 m but not exceeding 6.0 m deep	m3	9,700		
L	Exceeding 6.0 m but not exceeding 7.5 m deep	m3	9,700		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Lift shaft Pits ; to receive isolated bases or the like; starting from reduced level:-				
A	Not exceeding 1.5m deep	m3	101		
B	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	101		
	Column pits ; to receive isolated bases or the like; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	84		
D	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	84		
	Extra over all kinds of excavation irrespective of depth for:-				
E	All kinds of rock	m3	2,444		
F	Trim and level sides and surfaces of rock	m2	2,191		
	DISPOSAL				
	Surplus excavated materials				
G	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	51,314		
H	Extra over 300mm thick, clearing loose material at bottom of excavated surface	m3	2,200		
I	Grade,level and compact to falls,cross falls and slopes; compact to 105% MDD	m2	7,301		
	Backfill material				
J	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	4,129		
K	Return, fill and ram selected excavated materials in layers maximum 150 mm thick	m3	4,129		
	Disposal of water				
L	Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Bore 100mm diameter shaft to an individual depth of 2m, remove surplus material and insert 75mm diameter UPVC pipes(m/s)	m	100		
B	Manhole size 600 x 600 x 600mm deep with 100mm reinforced concrete walls and slab in concrete class 30/20mm including waterproofed cement sand plaster finish; complete with medium duty manhole cover	No	4		
	Plunking and strutting				
C	Planking and strutting to sides of all excavations : keep excavations free from all fallen materials; including shoring where applicable	Item	1		
	FRENCH DRAIN FILLING				
	Aggregate filling in making up levels				
D	Over 300mm thick; depositing loose approved aggregate to sides of basement wall maximum size of aggregate to be 20mm; compact in layers	m3	1,982		
	Open ended perforated UPVC french drain pipe laid to fall 1 in 300 including setting in 20mm loose aggregate surround (m/s) encased in geotextile membrane (m/s) all to Engineer's approval				
E	200mm diameter	m	367		
	Geotextile filter				
F	Bidim geotextile filter grade A3 as manufactured by Kaytech or equal and approved	m2	400		
	Water bars; standard PVC bulb edged strip; as "sika" or other equal and approved				
G	500mm wide; casting into concrete; temporary fixing to formwork; all in accordance with manufacturer's printed instructions	m	534		
	FILLING				
	Hardcore				
	Supply approved hardcore on site or other equal and approved base material in making up levels.				
H	Over 300mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	3,500		
	Stone or quarry dust				
	Blinding surfaces of fill				
I	50 mm thick	m2	6,995		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Lift pits				
A	Leave/Form sinking in hardcore for lift pits depth n.e 2 metres	m2	70		
B	Ditto sinking in blinding surface	m2	70		
	ANTI TERMITE AND HERBICIDE TREATMENT Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
C	To surfaces of blinded hardcore	m2	6,995		
	Damp-proof membranes				
D	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	6,995		
	CONCRETE WORK Insitu blinding ; mass concrete ; class 30/20mm to:				
E	Raft foundation; average 100 mm thick; with and including waterproofing admixture as "sika" or equal and approved	m2	6,200		
F	Bases; average 100 mm thick ditto	m2	56		
G	Lift shaft bases; average 100 mm thick ditto	m2	70		
	Insitu :class 35/20mm; Vibrated; Reinforced				
H	Horizontal; 1200mm thick raft; with and including waterproofing admixture as "sika" or equal and approved	m3	7,440		
I	Ditto at column base	m3	34		
J	Ditto at lift base	m3	84		
K	Extra over concrete slab for power floated smooth finish with approved Sika floor hardener to surface of concrete. Apply as per manufacturer's written instruction	m2	6,200		
L	450 mm thick basement retaining walls straight or curved as plan; with and including waterproofing admixture as "sika" or equal and approved	m3	1,170		
M	450 mm thick shear walls ditto	m3	216		
N	1300 mm thick shear walls ditto	m3	606		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	450 mm thick lift shaft walls ditto	m3	171		
B	450 mm thick water tank walls ditto	m3	73		
C	Beams; horizontal or sloping or curved not exceeding 15 degrees from horizontal ditto	m3	1,133		
D	Columns; vertical or sloping not exceeding 15 degrees from horizontal ditto	m3	406		
E	250mm thick suspended slab; with and including waterproofing admixture as "sika" or equal and approved	m2	6,200		
G	Extra over raft slab thickening average 650mm wide x 300mm thick	m	367		
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
H	Assorted sizes(T8-T40mm bars)	Kg	1,621,144		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
I	In concrete blinding	m2	6,326		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Form work generally				
	To soffits of suspended floors				
A	Generally ; horizontal	m2	6,200		
	Edges of suspended slab				
B	Girth 225 mm to 300 mm	m	417		
	Sides ; vertical or battering				
C	Columns or the like	m2	1,782		
D	Ditto for circular columns	m2	430		
E	Column bases or the like	m2	79		
F	Vertical sides and soffits of beams; including curved to plan	m2	6,571		
G	Vertical sides of shear walls; curved to required radii	m2	1,894		
H	Edges of shear walls ditto	m2	45		
I	Vertical sides of basement retaining walls	m2	5,200		
J	Vertical sides of raft	m2	843		
K	Vertical sides of lift base	m2	96		
L	Vertical sides of lift shaft walls	m2	760		
M	Edges of lift shaft walls	m	21		
N	Vertical sides of water tank walls	m2	324		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Skin wall</p> <p>Selected approved quality natural stone fine machine dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks: : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to</p>				
A	200mm Thick skin walling	m2	1,982		
	<p>WATERPROOFING</p> <p>PROTECTIVE SCREED</p> <p>40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing</p>				
B	Horizontal surface of raft blinding	m2	6,200		
C	Sides of raft blinding	m2	38		
D	Horizontal surface of raft	m2	6,200		
E	Sides of raft slab	m2	441		
F	Skin walls; vertical; over 300 mm	m2	1,982		
G	Retaining walls; vertical; over 300 mm	m2	5,200		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastick smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
A	Horizontal surface of raft blinding	m2	6,200		
B	Sides of raft blinding	m2	38		
C	Horizontal surface of raft	m2	6,200		
D	Sides of raft slab	m2	441		
E	Skin walls; vertical; over 300 mm	m2	1,982		
F	Retaining walls; vertical; over 300 mm	m2	5,200		
G	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	SUNDRY ITEMS				
	SUMP				
H	Extra over reinforced concrete floor slab for 1 No. Sump overall size 5000 mm long x 4500 mm wide; average depth of 1000 mm (internal dimensions) having 200mm thick sides and bottom in concrete class 30/20 mm) and including water proofed cement sand plaster finish and Bentonite waterproofing membrane as "mapeproof" or other equal and approved to bottom and sides; including for all necessary excavations, earthworks, formwork and concrete work	No	2		
	Internal coved or angle fillet				
I	120mm rubber tape with alkali-resistant fabric angle filler as mapeband as supplied by Mapei	m	500		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	COLUMN PROTECTION DETAIL				
A	50 mm x 50 mm x 3 mm galvanized mild steel angle with 3 No. mild steel lug cast into concrete at 400 mm centres; 1000 mm high fixed flush to column finish including approved reflective safety tape; all to architects detail	No	200		
	WALL GUARD DETAIL				
	2No. 3mm thick x 100mm Diameter galvanised mild steel horizontal guard rail fixed to wall with and including 50mm diameter galvanised steel horizontal anchors to Architect's details and approval.				
B	450 mm high to detail	m	150		
	BOLLARDS				
	200mm diameter stainless steel bollards in filled with mass concrete cast in concrete slab (ms)				
C	900 mm high to detail	No	4		
	CONSTRUCTION JOINT (PROVISIONAL)				
D	Supply and fix approved chicken wire, waterproofing and bonding with sika bonding agent including construction joints with "eporip" or other equal and applied epoxy adhesive sealant applied with manufacturer's specifications in 1200 mm thick reinforced concrete (m/s) including all necessary formwork; R25 dowels at 200mm centres all to Engineers approval	m2	306		
	EXPANSION JOINTS				
E	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	910		
F	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	426		
G	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	910		
	DRAINAGE				
H	Form or leave in concrete raft 300mm wide x 100mm deep channel including covering in mild steel grating; horizontal all to approval	m	200		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	EXCAVATION AND CONCRETE WORKS				
	<u>SECTION SUMMARY- EXCAVATION AND CONCRETE WORKS</u>				
	Total Brought Forward from Page No.		Page No. 3/1		
			3/2		
			3/3		
			3/4		
			3/5		
			3/6		
			3/7		
			3/8		
			3/9		
	TOTAL FOR EXCAVATION AND CONCRETE WORKS CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	18		
B	250 mm thick concrete landings	m2	23		
	REINFORCEMENT				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	3,088		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75mm to 150mm	m	205		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	37		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	43		
	To soffits; horizontal				
G	Landing	m2	23		
	Soffits; sloping				
H	Waists of stairs and the like	m2	67		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	24		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 75mm diameter x 3mm thick stainless steel tube handrail welded to 75mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	23		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	30		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES				
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and zero jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	205		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	74		
C	To risers; 150 mm high full length slab	m	205		
D	To landing; tiles to approved sizes and pattern	m2	23		
B	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	37		
C	Ditto to edges of landing; 250mm high full lenth slab	m	43		
D	25 mm thick x 150 mm high matching skirting to stairs; internal	m	80		
E	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	205		
	BEDS OR BACKINGS				
	Screed; cement sand backing (1:4) 40 mm thick one coat beds; wood floated to receive granite slab(m/s) to concrete or block work base; generally to				
F	Treads; 300 mm wide; internal	m	205		
G	Risers; 150 mm high; internal	m	205		
H	Landing	m2	23		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to; Soffits of stairs; sloping	m	37		
B	Over 300mm girth; internal Soffits of landing; horizontal	m2	67		
C	Over 300mm girth; internal To open edges of landing	m2	23		
D	Girth 225 to 300mm; internal To open string of staircase	m	43		
E	Open strings of staircases; 225 to 300mm; internal PAINTING AND DECORATING One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction Steel trowelled plastered soffits; internally To steel trowelled plastered surfaces	m	37		
F	Soffits of stairs; sloping Over 300mm girth; internal	m2	67		
G	Soffits of landing; horizontal Over 300mm girth; internal	m2	23		
H	To open edges of landing Girth 225 to 300mm; internal	m	43		
I	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	37		
Carried to Collection					

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	STAIRCASE AND STAIRCASE FINISHES				
	<u>SECTION SUMMARY- STAIRCASE AND STAIRCASE FINISHES</u>				
	Total Brought Forward from Page No.		Page No. 3/11		
			3/12		
			3/13		
			3/14		
	TOTAL FOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO. 3</u>				
	<u>RAMPS AND RAMP FINISHES</u>				
	INSITU CONCRETE : REINFORCED Insitu :class 35/20mm; Vibrated; Reinforced Ramp				
A	Horizontal; 200mm thick slab	m2	795		
B	200 mm thick ramp walls	m2	1,100		
C	Extra over concrete slab for power floated smooth finish with approved Sika floor hardener to surface of concrete. Complete with ribbed finish. Apply as per manufacturer's written instruction.	m2	795		
	REINFORCEMENT				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks and spacers				
D	Assorted sizes(T8-T16mm bars)	kg	37,900		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally Soffits; sloping not exceeding 15 degrees from the horizontal; internal; over 300 mm				
E	Generally to ramps	m2	795		
	Edges of ramp				
F	Over 150mm but not exceeding 225mm wide	m	324		
	To vertical or battering sides				
G	Up stand walls; vertical	m2	2,200		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	RAMP FINISHES				
	Plaster; cement, sand and lime; with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; steel trowelled; hard and smooth Soffits ;sloping not exceeding 15 degrees from the horizontal ; internal ; over 300 mm				
A	Walls; vertical; To open edges of ramp	m2	2,200		
B	150mm; internal	m	324		
	BEDS OR BACKINGS				
	Screed ; Cement sand backing (1:4) 30 mm thick one coat beds; wood floated to receive epoxy finish (m/s) to concrete base; generally to				
C	Ramp floor Works to be executed by an approved specialist Supply and apply anti-static solvent free high build epoxy floor including grinding surface to remove surface laitance and expose defects, repairing defects and cracks, fill control joints with shrinkage compensated mortar; apply moisture barrier and Captive blasting and wash with approved acid; apply epoxy primer with and including 0.5mm quartz sand , epoxy undercoat and one top coat of epoxy ; applied in accordance with manufacturer's printed instructions 3 mm thick, 2 No coat work to concrete base (m.s); generally to ramp floor	m2	240		
D	Generally to ramps	m2	240		
E	Walls; vertical; internal To open edges of ramp	m2	2,200		
F	150mm; internal	m	324		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>PAINTING AND DECORATING</p> <p>One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction Steel trowelled plastered surfaces of wall; internally</p> <p>To steel trowelled plastered surfaces of soffits ;sloping not exceeding 15 degrees from horizontal; internal; over 300mm</p>				
A	Walls; vertical; internal	m2	2,200		
	<p>GLASS COVER FINISH</p> <p>Supply and fix 20mm thick toughened safety glass as supplied by Impala Glass Industries Kenya Ltd or other equal and approved; including polyvinyl butuyral (PVB) film solar glass fixed on 150x150x3mm thick SHS mild steel supports ; fixed in accordance with manufacturer's recommendations as described on:-</p>				
B	To skylight above ramps	m2	1932		
	<p>Structural mild steel to BS 4360 grade 43C in roof structure: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail</p>				
C	150 X 150 X 3mm SHS	Kg	8,410		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>Sundries</u>				
A	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	44		
B	12mm dia x 400mm long bolt; complete with nut and washers	No	176		
C	12mm dia x 1000mm long mild steel anchor bolts; complete with nut and washers	No	44		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
D	General surface of steel members	m2	274		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	RAMP AND RAMP FINISHES				
	<u>SECTION SUMMARY- RAMP AND RAMP FINISHES</u>				
	Total Brought Forward from Page No.		Page No. 3/16		
			3/17		
			3/18		
			3/19		
	TOTAL FOR RAMP AND RAMP FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 4				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	700		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m	133		
	TOTAL FOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 5</u></p> <p><u>DOORS AND ASSOCIATED FINISHES</u></p> <p>MILD STEEL DOORS</p> <p>Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth</p>				
A	Double leaf door overall size 2000 mm wide x 2700 mm high	No	7		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Single leaf door; overall size 900 mm wide x 2700 mm high	No	1		
B	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	6		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>FIRE DOOR</p> <p>Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved</p> <p>120 minutes Fire door as "ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.</p>				
A	<p>Double leaf door overall size 1000 mm wide x 2700 mm high with view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing</p>	No	2		
	<p><u>PAINTING AND DECORATION</u></p> <p>Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish</p>				
B	<p>General surface of steel doors</p>	m2	80		
	<p>Carried to Collection</p>				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	DOOR AND ASSOCIATED FINISHES				
	<u>SECTION SUMMARY- DOORS AND ASSOCIATED FINISHES</u>				
	Total Brought Forward from Page No.		Page No. 3/22 3/23 3/24		
	TOTAL FOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts ,sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 5000 x 2500 mm high high	No	2		
B	Window overall size 2500 x 2500 mm high	No	4		
C	Window overall size 1500 x 2500 mm high	No	1		
	Supply and fix the following standard windows; heavy duty steel casement doors as manufactured by an approved steel fabricator; comprising of 100 x 50 x 4mm pressed frame, stiles and middle rails, complete with fabricated steel louvres at top ; including fixing lugs and wrought iron ironmongery,(stays and locks) and fittings all primed with one coat of etch primer before fixing including bedding and pointing in cement and sand (1:4) mortar: oiling and adjusting on completion: complete with gauze wire screen with coffee wire fixed on steel louvres : all in accordance with Architect's details				
D	Window overall size 3000 x 600 mm high	No	14		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>GLAZING</u>				
	Supply and fix 6mm thick laminated glass fixed to timber with putty (m.s) as described:-				
A	In panes not exceeding 0.50 square meters	m2	25		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
B	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	25		
C	Ditto 500 x 100mm thick	m	50		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
D	Over 300 mm ; Internally and externally	m2	51		
	Carried to Collection				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	WINDOWS AND ASSOCIATED FINISHES				
	<u>SECTION SUMMARY- WINDOWS AND ASSOCIATED FINISHES</u>				
	Total Brought Forward from Page No.		Page No. 3/26 3/27		
	TOTAL FOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>BASEMENT FINISHES</u>				
	<u>WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to retaining and shear walls; vertical; internally	m2	2,815		
B	Ditto columns; vertical; internally	m2	2,212		
C	Ditto lift shaft walls	m2	171		
D	Ditto concrete block wall	m2	1,400		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction Steel trowelled plastered surfaces of wall; internally				
E	Retaining and Shear Walls; vertical; internal	m2	2,815		
F	Columns; vertical; internal	m2	2,212		
G	Lift shaft walls internally	m2	171		
H	Concrete block walling	m2	1,400		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
A	12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally Lift walls; vertical; internal	m2	395		
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and zero jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
B	Lift walls; vertical;	m2	395		
C	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>BASEMENT FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed ; Cement sand backing (1:4)				
	30 mm thick one coat beds; wood floated to receive epoxy finish (m/s) to concrete base; generally to				
A	Basement floor	m2	6,200		
	Works to be executed by an approved specialist				
	Supply and apply anti-static solvent free high build epoxy floor including grinding surface to remove surface laitance and expose defects, repairing defects and cracks, fill control joints with shrinkage compensated mortar; apply moisture barrier and Captive blasting and wash with approved acid; apply epoxy primer with and including 0.5mm quartz sand , epoxy undercoat and one top coat of epoxy ; applied in accordance with manufacturer’s printed instructions				
	3 mm thick, 2No coat work to concrete base (m.s); generally to parking floor				
B	Floors; horizontal	m2	6,200		
C	Extra over for numbering parking bays in epoxy	No	250		
D	Extra over for road marking 100mm wide in epoxy	m	2,139		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>BASEMENT CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 6 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	Ceiling and soffits of beams; horizontal; internal	m2	6,200		
B	Sides of beams; horizontal; Internal	m2	7,083		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction Steel trowelled plastered surfaces of wall; internally				
	Steel trowelled plastered surfaces of wall; internally				
C	Ceilings ; girth over 300 mm ; internal	m2	6,200		
D	Beams; horizontal; Internal	m2	7,083		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	BASEMENT FINISHES				
	<u>SECTION SUMMARY- BASEMENT FINISHES</u>				
	Total Brought Forward from Page No.		Page No. 3/29		
			3/30		
			3/31		
			3/32		
	TOTAL FOR BASEMENT FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION**

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>WATER TANK</u>				
	WATERPROOFING				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors and ceiling; horizontal; Over 300mm wide	m2	207		
B	Walls; vertical; over 300 mm	m2	354		
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
C	Floors; horizontal; over 300 mm	m2	207		
D	Walls; vertical; over 300 mm	m2	354		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	SUNDRY ITEMS				
	SUMP				
F	Sump overall size 1000 mm long x 1000 mm wide; average depth of 800 mm (internal dimensions) having 200mm thick sides and bottom in concrete class 35/20 mm) and including water proofed cement sand plaster finish and Bentonite waterproofing membrane as "mapeproof" or other equal and approved to bottom and sides; including for all necessary excavations, earthworks, formwork and concrete work	No	1		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	PURPOSE MADE UNITS				
	LADDERS				
	Stainless steel ladder comprising of 2 No. 25m diameter solid section stainless steel post with both ends of post kned to required lengths and built into concrete wall having 25mm diameter x 450mm long rolled section rungs, welded to post at 300mm centres and including grinding welds smooth,priming and painting; make good disturbed surfaces				
A	4500 mm long	No	2		
	Manhole Cover				
B	600 mm x 600 mm extra heavy duty single seal solid chequered cover with hand holes and frames to B.S 497	No	2		
C	1200 mm x 1800 mm Ditto	No	1		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE
COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3				
	WATER TANK				
	<u>SECTION SUMMARY- WATER TANK</u>				
	Total Brought Forward from Page No.		Page No. 3/34 3/35		
	TOTAL FOR WATER TANK CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc				
A	Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces	Item	1		
	TOTAL FOR BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 3				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Basement

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 3 BASEMENT <u>SECTION SUMMARY- BASEMENT</u>				
1	EXCAVATION AND CONCRETE WORKS	Page	3/10		
2	STAIRCASE AND STAIRCASE FINISHES	Page	3/15		
3	RAMP AND RAMP FINISHES	Page	3/20		
4	WALLING	Page	3/22		
5	DOORS AND ASSOCIATED FINISHES	Page	3/25		
6	WINDOWS AND ASSOCIATED FINISHES	Page	3/28		
7	BASEMENT FINISHES	Page	3/33		
8	WATER TANK	Page	3/36		
9	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	3/37		
	Carried to Final Summary				
	Section No. 3 BASEMENT				

GROUND FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 4</u>				
	<u>GROUND FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>SUBSTRUCTURES</u> <u>(All Provisional)</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	500		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	500		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	500		
D	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	500		
	Pits ; to receive isolated bases or the like; starting from reduced level:-				
E	Not exceeding 1.5m deep	m3	84		
F	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	84		
	Foundation strips; starting from reduced level:-				
G	Not exceeding 1.5m deep	m3	80		
H	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	80		
	Extra over all kinds of excavation irrespective of depth for:-				
I	All kinds of rock	m3	116		
J	Trim and level sides and surfaces of rock	m2	100		
	DISPOSAL				
	Surplus excavated materials				
K	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	1,444		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Backfill material Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	500		
B	Return, fill and ram selected excavated materials in layers maximum 150 mm thick	m3	500		
C	Disposal of water Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
D	Plunking and strutting Planking and strutting to sides of all excavations : keep excavations free from all fallen materials	Item	1		
E	FILLING Hardcore Supply approved hardcore on site or other equal and approved base material in making up levels. 500mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	384		
F	Stone or quarry dust Blinding surfaces of fill 50 mm thick	m2	400		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ANTI TERMITE AND HERBICIDE TREATMENT Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
A	To surfaces of blinded hardcore	m2	400		
	Damp-proof membranes				
B	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	400		
	CONCRETE WORK Insitu blinding ; mass concrete ; class 15/25mm				
C	Foundation strip	m2	48		
D	Bases	m2	56		
	Insitu ; mass concrete ; class 35/25mm				
F	Strip Footing	m3	10		
G	Bases	m3	34		
H	Columns; Vertical or sloping exceeding 15 degrees from horizontal	m3	14		
I	200mm thick ground floor slab	m2	400		
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
Q	Assorted sizes(T8-T40mm bars)	kg	14,360		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks</p> <p>In ground floor slab</p>	m2	400		
B	<p>FORMWORK TO INSITU CONCRETE</p> <p>Edges of ground floor slab</p> <p>150 to 225 mm wide</p>	m	88		
C	<p>Sides ; vertical or battering</p> <p>Circular columns or the like</p>	m2	85		
D	<p>Column bases</p>	m2	79		
E	<p>Strip footing</p>	m2	32		
F	<p>Foundation Walling</p> <p>Selected approved quality natural quarry stone fine hand dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks: : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to</p> <p>200mm Thick foundation walling</p>	m2	250		
G	<p>Plinth treatment</p> <p>12mm thick cement and sand (1:4) render to plinths</p>	m2	50		
H	<p>Prepare and apply two coats of bituminous emulsion to rendered surfaces</p>	m2	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 4				
	SUBSTRUCTURE				
	<u>SECTION SUMMARY-SUBSTRUCTURE</u>				
			Page No.		
	Total Brought Forward from Page No.		4/1		
			4/2		
			4/3		
			4/4		
	TOTAL FOR SUBSTRUCTURES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Steps				
A	Steps at entrances	m3	107		
	Ground beam				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	100		
	Intermediate beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
D	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	1,447		
	Up stand beams				
E	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	40		
	Columns				
F	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
G	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
H	450 mm thick	m3	142		
	Suspended solid floor slab				
I	250 mm thick ; horizontal	m2	4,500		
	Suspended roof slab				
J	250 mm thick ; horizontal	m2	92		
	Ramp 1:12				
K	200 mm thick	m2	57		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,592		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	600		
	To edges of ramp				
C	Girth 150 mm to 225 mm	m	101		
	Risers of steps				
D	Girth 75mm to 150mm	m	286		
	Waist of stairs; to profile of steps				
E	To edges of waists of steps cut to profile of steps - 500 mm wide extreme	m	16		
	Sides of steps				
F	To sides of steps	m2	27		
	To vertical or battering sides				
G	Columns or the like; vertical and curved	m2	1,040		
H	Circular curved columns	m2	530		
I	Vertical sides of shear walls; curved to required radii	m2	500		
J	Edges of shear walls ditto	m2	10		
K	Vertical sides of lift shaft walls	m2	632		
L	Edges of lift shaft walls	m	19		
M	Vertical sides and soffits of beams; curved to required radii	m2	6,624		
N	Vertical sides of upstand beams; horizontal ditto	m2	275		
O	Vertical sides of ground beams; ditto	m2	445		
P	Vertical sides of intermediate beams;ditto	m2	550		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
A	Assorted sizes(T8-T40mm bars)	kg	565,194		
	EXPANSION JOINTS				
B	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
C	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
D	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/6 4/7 4/8		
	TOTAL FOR GROUND FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	26		
B	250 mm thick concrete landings	m2	70		
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	5,655		
	FORMWORK TO INSITU CONCRETE Formwork generally Risers of steps and staircases				
D	Girth 75m m to 150mm	m	282		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	103		
	To soffits; horizontal				
G	Landing	m2	70		
	Soffits; sloping				
H	Waists of stairs and the like	m2	95		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	31		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 75mm diameter x 3mm thick stainless steel tube handrail welded to 75mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	21		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	62		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	282		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	102		
C	To risers; 150 mm high full length slab	m	282		
D	To landing; tiles to approved sizes and pattern	m2	70		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	51		
C	Ditto to edges of landing; 250mm high full length slab	m	103		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	154		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	282		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 40 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	282		
I	Risers; 150 mm high; internal	m	282		
J	Landing	m2	70		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	95		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	70		
C	To open edges of landing Girth 225 to 300mm; internal	m	103		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	95		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	70		
G	To open edges of landing Girth 225 to 300mm; internal	m	103		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/10 4/11 4/12 4/13		
	TOTAL FOR GROUND FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	2,700		
B	150mm thick walls	m2	480		
C	100mm thick walls	m2	301		
	<u>INTERNAL PARTITIONING</u>				
	ALUMINIUM FRAMED PARTITIONING				
D	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	350		
	<u>HDF PARTITIONS</u>				
E	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAMELESS GLASS PARTITION				
A	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	243		
	GLASS FILMS				
B	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	593		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
C	100mm thick walls	m2	112		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/15 4/16		
TOTAL FOR GROUND FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 4					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>EXTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	1,592		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m2	105		
TOTAL FOR GROUND FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 4					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	380		
B	Ditto transomes	m	50		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	230		
D	Ditto transomes	m	25		
	Architraves				
E	75 x 25 mm moulded	m	610		
	Quadrants				
F	25 x 25 mm	m	610		
	Beading; To fanlight				
G	25 x 25 mm	m	199		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	230		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	230		
	WPC Door Quadrants				
J	50 x 25 mm	m	230		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	2		
B	Single leaf door; overall size 900 mm wide x 2700 mm high	No	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>MILD STEEL DOORS</p> <p>Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth</p>				
A	Double leaf door overall size 4000 mm wide x 2700 mm high	No	2		
B	Ditto 2000 mm wide x 2700 mm high	No	1		
C	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
A	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	31		
B	Ditto overall size 800 mm wide x 2400 mm high openable door	No	7		
C	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
D	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	2		
E	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	38		
F	Single leaf door double swing overall size 1200 x 2700mm high	No	12		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>FLUSH DOORS</p> <p>Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door</p>				
A	Single leaf door overall size 900 x 2700mm high	No	31		
	<p>FIRE DOOR</p> <p>Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved</p> <p>120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.</p>				
B	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAMELESS GLASS DOOR				
	12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details				
A	Sliding door; Overall size 5000 x 2700mm high	No	1		
B	Ditto overall size 3800 x 2700mm high	No	1		
C	Ditto overall size 3600 x 2700mm high	No	4		
D	Ditto overall size 3000 x 2700mm high	No	1		
E	Ditto overall size 2200 x 2700mm high	No	2		
F	Ditto overall size 1800 x 2700mm high	No	1		
	12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door with screwed to concrete beam with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval				
G	Double leaf door; Overall size 5000 x 2700mm high	No	1		
H	Ditto overall size 2000 x 2700mm high	No	2		
I	Single leaf door overall size 1000 x 2700mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DUCT DOORS				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	7		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
B	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	100.0		
C	Ditto 100mmx3.25mm	Pairs	67.5		
D	150mm heavy duty double action spring hinges	Pairs	18		
E	32x600mm high satin stainless steel straight pull handles back to back to approval	No	217		
F	Stainless steel push plate-100x300mm	No	217		
G	Stainless steel pull plate-100x300mm	No	217		
H	19x225mm high S.S conceal fix pull handles	No	217		
I	Stainless steel Abbloy handles on Rose	No	59		
J	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	59		
K	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	31		
L	5-Lever mortice lock complete with aluminium lever handles	No	52		
M	Satin Nickel 70mm Euro restricted Double cylinder	No	52		
N	Oval satin nickel floor mounted door stop fixed with screw to approval	No	141		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	800 x 200mm high stainless steel kick plate onto both sides to approval	No	194		
B	Satin steel Euro profile escutcheons	No	52		
C	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	84		
D	Coat and hat hook with rubber tip in stainless steel finish	No	85		
E	Indicator lock 'Vacant / Engaged'	No	39		
F	Indicator lock 'Vacant / Engaged'-disabled	No	3		
G	200x300mm high stainless steel transfer grills	No	194		
H	Door viewer	No	10		
I	Door guard wish bone tye satin finish	No	10		
PAINTING AND DECORATING					
One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved					
Metal surfaces					
J	Over 300 mm ; Internally	m2	60		
K	Over 300 mm ; externally	m2	60		
Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-					
Wood surfaces; before fixing					
L	Door frame; girth 200 mm to 300 mm	m	610		
M	Door frame; girth 100 mm to 200 mm	m	230		
N	Architraves girth not exceeding 100 mm	m	840		
O	Quadrants/Beading girth not exceeding 100 mm	m	840		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
A	Door frame; girth 200 mm to 300 mm	m	915		
B	Architraves girth 100 mm to 200mm	m	1,070		
C	Quadrants/beading girth not exceeding 100 mm	m	809		
D	General surfaces of wood	m2	516		
	<u>GLAZING</u>				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
E	In panes not exceeding 0.50 square meters	m2	22		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/19 4/20 4/21 4/22 4/23 4/24 4/25 4/26 4/27		
	TOTAL FOR GROUND FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 7				
	WINDOWS AND ASSOCIATED FINISHES				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts, sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 5000 x 2000 mm high	No	5		
B	Window overall size 2100 x 2000 mm high	No	2		
C	Window overall size 2000 x 2000 mm high	No	22		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
D	250 x 25mm Window board	m	100		
E	20 x 25mm Quadrant beading	m	100		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
F	100 x 18mm full length slab; weathered and throated smooth "Jet Black" granite window cill bedded and jointed with cement sand (1:4) mortar	m	10		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	300 x 18mm thick full length slab; bull-nosed jet black granite window board Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-	m	10		
B	Back of wood frames over 200mm but not exceeding 300mm girth	m	100		
C	Ditto: 0-100 mm girth Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-	m	100		
D	Timber surfaces between 200-300mm girth	m	100		
E	Ditto: 0-100 mm girth WINDOW BLINDS				
F	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/transluscent heavy fire retardant fabrics complete with rings,rollers brass I section rails and all other necessary accessories WINDOW CILL Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3)	m2	293		
G	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	85		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/29 4/30		
	TOTAL FOR GROUND FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	INTERNAL WALL FINISHES				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	6,839		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4) 12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally				
D	Walls; vertical; internal	m2	3,703		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	Walls; vertical; internal	m2	3,158		
F	Extra over for 100 mm wide decorative tile to approval	m	591		
G	Aluminium edging strip to corners of granito tiled walls	m	550		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	70		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	To waterfeature	m2	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
A	Walls; vertical; internal	m2	6,839		
B	Columns; vertical; internal	m2	1,623		
C	Gypsum partitions	m2	224		
D	Lift shaft and shear walls internally	m2	826		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/32 4/33 4/34		
	TOTAL FOR GROUND FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>EXTERNAL WALL FINISHES</u>				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at terraces	m	81		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 75mm diameter x 3mm thick stainless steel tube handrail welded to 75mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	92		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	10		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	1,200		
B	Ditto to beams	m2	460		
	Specialist applied textured finish as 'Marmoran" supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	1,200		
D	To plastered beams	m2	460		
	INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)				
E	Generally to columns	m2	221		
	Granite column finish Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to 20 mm thick; butt joints straight both ways				
F	To plastered columns	m2	221		
G	25 x 15 mm solid brass decorative strip to tiled walls	m	150		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	140		
B	<p>To plastered concrete upstands</p>	m2	140		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	<p>Curtain walling generally; diagonal sections; curved to profile</p> <p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>	m2	1,200		
B	Window size 1200 x 1200 mm high	No	70		
C	Window size 1050 x 1050 mm high	No	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/36 4/37 4/38 4/39		
	TOTAL FOR GROUND FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	INTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	490		
B	Ditto to receive granite	m2	1,178		
C	Ditto to receive marble	m2	100		
D	Ditto to receive porcelain tiles	m2	985		
E	Ditto to receive carpet	m2	550		
F	Ditto to receive non-slip acidic resistant /anti-corrosive tiles ceramic tiles	m2	569		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Floors; level; internal;	m2	490		
H	18 mm thick x 150mm high skirting; floor; internal	m	519		
I	25 x 15 mm solid brass decorative strip to tiled floor	m	300		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
J	Floors; level; internal;	m2	1,178		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>20 mm thick x 150mm high skirting; floor; internal</p> <p>Supply and fix polished and sealed coloured or white marble slab from an approved source laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to</p>	m	376		
B	Floors; level; internal;	m2	100		
C	<p>25 mm thick x 150mm high skirting; floor; internal</p> <p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>	m	48		
D	Floors; level; internal;	m2	985		
E	18 mm thick x 150mm high skirting; floor; internal	m	417		
F	<p>25 x 15 mm solid brass decorative strip to tiled floor</p> <p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.1kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>	m	400		
G	To screeded floor	m2	550		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Mahogany timber skirting				
A	150 x 25mm thick moulded timber skirting	m	920		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
B	Surfaces over 100mm but not exceeding 200mm girth	m	920		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 100-200 mm girth	m	920		
	Acid resistant ceramic tiles				
	Supply and fix approved non-slip acid resistant/anti-corrosive ceramic tile from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
D	Floors; horizontal	m2	569		
E	18 mm thick x 150mm high skirting; floor; internal	m	208		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/41 4/42 4/43		
TOTAL FOR GROUND FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granite	m2	368		
B	Treads; 450 mm wide ditto	m	315		
C	Risers; 150 mm high ditto	m	315		
D	To sides of steps	m2	74		
E	Floors; horizontal; external; epoxy finish	m2	100		
F	Floors; horizontal; external; receive porcelain tiles	m2	266		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
G	Floors; level; external;	m2	368		
H	20 mm thick x 150mm high skirting; floor; external	m	159		
I	To treads; 450 mm wide full length slab with bull nosings (rounded and double granite edges)	m	315		
J	To risers; 150 mm high full length slab	m	315		
K	To sides of steps	m2	74		
L	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	315		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Works to be executed by an approved specialist</p> <p>Supply and apply anti-static solvent free high build epoxy floor including grinding surface to remove surface laitance and expose defects, repairing defects and cracks, fill control joints with shrinkage compensated mortar; apply moisture barrier and Captive blasting and wash with approved acid; apply epoxy primer with and including 0.5mm quartz sand , epoxy undercoat and one top coat of epoxy ; applied in accordance with manufacturer’s printed instructions</p> <p>3 mm thick, 2 No coat work to concrete base (m.s); generally to service yard</p>				
A	Floors; horizontal	m2	100		
B	20 mm thick x 150mm high skirting; floor; internal	m	61		
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
D	Floors; level; internal;	m2	266		
E	18 mm thick x 150mm high skirting; floor; internal	m	40		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED SLABS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	To slab; horizontal; over 300mm wide	m2	1,241		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	To plastered slab; horizontal; over 300 mm	m2	1,241		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	210mm diameter rainwater downpipe: fixed to wall using brackets	m	60		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	10		
F	Rainwater shoe	No	10		
G	Rainwater outlets: 210mm diameter	No	10		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	10		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	10		
	Zip Drain				
C	HPDE high density polyethylene single cuspated drainage sheet as "Tefond' supplied by Itabuild laid horizontally with stud surface facing up: 150mm laps	m2	1,200		
	Geotextile filter				
D	Bidim geotextile filter grade A3 as manufactured by Kaytech or equal and approved	m2	1,200		
	Graded filter material backfilling				
E	200mm average thick; spreading and levelling on roof deck	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/45 4/46 4/47 4/48		
	TOTAL FOR GROUND FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,090		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,100		
C	Cornices 150 x 25 mm polyurethane cornice	m	1,500		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	210		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	184		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	217		
G	Sides of beams; horizontal; Internal	m2	5,478		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	217		
B	Beams; horizontal; Internal	m2	5,478		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	2,640		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	693		
E	Ditto perforated for backlighting	m2	200		
	MDF laser cut out ceilings				
F	Supply and fix 18mm thick MDF laser cut out ceiling to Architect's details	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/50 4/51		
	TOTAL FOR GROUND FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 13				
	EXTERNAL CEILING FINISHES				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	491		
B	Sides of beams; horizontal; external	m2	209		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	491		
D	Beams; horizontal; external	m2	209		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm ; comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	368		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p><u>ROOF SKYLIGHTS</u></p> <p>Supply and fix 18mm thick toughened safety glass (6mm+6mm+6mm) as supplied by Impala Glass Industries Kenya Ltd or other equal and approved; including polyvinyl butuyral (PVB) film solar glass fixed on and including 75x75x3mm thick SHS mild steel trusses finished in zinc chromate primer and two coats of gloss oil paint; fixed in accordance with manufacturer's recommendations as described on:-</p>	m2	50		
	To skylight				
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/53 4/54		
	TOTAL FOR GROUND FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	296		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	579		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	296		
	Open 'U' drainage				
D	300mm wide(internal) open 'U' drain comprising of 700mm wide x 250mm thick concrete base; 500mm high x 200mm thick insitu class 35 concrete walls average 450mm high; including internal plaster, reinforcement and formwork	m	80		
	Mild steel grating at kitchen				
E	500mm wide mild steel channel grating : comprising 40 x 40 x 6mm edge frame : infilled with 40 x 6mm flats at 50mm centres : 40 x 40 x 6mm frame set in concrete with 150mm long mild steel end split lugs : smooth weld joints; red oxide primer: two coats gloss paint finish :	m	80		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Vanity Cabinets</p> <p>Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details</p>				
A	<p>Vanity cabinets overall size :average length 5000mm x 600mm wide x 900mm high</p> <p>Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.</p>	No	13		
B	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	21		
C	20 x 100 mm granite fascia	m	35		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Cabinets</p> <p>Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details</p>				
A	Low level cabinet overall size :overall length 5500mm x 600mm wide x 900mm high at lactation rooms	No	1		
B	Ditto overall size :overall length 4500mm x 600mm wide x 900mm high at lounges	No	2		
C	Ditto overall size :overall length 7400mm x 600mm wide x 900mm high at kitchenette	No	1		
D	Ditto overall size :overall length 13000mm x 600mm wide x 900mm high at media	No	1		
	Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.				
E	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	22		
F	20 x 100 mm granite fascia	m	36		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p> <p>High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high</p>	No	5		
	<p>Bar Cabinets</p> <p>Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details</p>				
C	Bar cabinets overall size :average length 7000mm x 600mm wide x 900mm high	No	2		
D	Ditto overall size :average length 4000mm x 600mm wide x 900mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Bar worktop: 600mm wide : with round edges : form holes for wash hand basin.				
A	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	7		
B	20 x 100 mm granite fascia	m	11		
	High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors glazed with and including 6mm thick clear glass fixed with timber beading; doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery				
C	High level kitchen cabinet : overall size: length 4000mm x 300mm wide x 800mm high	No	3		
	Shelving at stores				
D	5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing; on and including mild steel brackets	m	50		
	Shelving at bars				
E	6 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing; on and including mild steel brackets	m	7		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 4/56 4/57 4/58 4/59 4/60		
	TOTAL FOR GROUND FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 15				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	22500 x 1300 x 10mm thick mild steel plates; with 24no. holes	No	1		
D	9000 x 1300 x 10mm thick mild steel plates; with 12no. holes	No	10		
E	12mm dia x 430mm HPM long bolts; complete with nut and washers	No	144		
F	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
G	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
H	General surface of steel members	m2	492		
	<u>ALUMINIUM COMPOSITE CLADDING</u>				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
I	Butt joints; over 300mm wide	m2	740		
	TOTAL FOR GROUND FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 4				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 16</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	<p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical, concealed fixings, building management system, audio visual, structured cabling, security, public address, solar water heating, boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
<p>TOTAL FOR GROUND FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 4</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 4				
	GROUND FLOOR				
	<u>SECTION SUMMARY- GROUND FLOOR</u>				
1	SUB-STRUCTURE	Page	4/5		
2	FRAME	Page	4/9		
3	STAIRCASE AND STAIRCASE FINISHES	Page	4/14		
4	INTERNAL WALLING	Page	4/17		
5	EXTERNAL WALLING	Page	4/18		
6	DOORS AND ASSOCIATED FINISHES	Page	4/28		
7	WINDOWS AND ASSOCIATED FINISHES	Page	4/31		
8	INTERNAL WALL FINISHES	Page	4/35		
9	EXTERNAL WALL FINISHES	Page	4/40		
10	INTERNAL FLOOR FINISHES	Page	4/44		
11	EXTERNAL FLOOR FINISHES	Page	4/49		
12	INTERNAL CEILING FINISHES	Page	4/52		
13	EXTERNAL CEILING FINISHES	Page	4/55		
14	FITTINGS	Page	4/61		
15	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	4/62		
16	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	4/63		
	Carried to Final Summary				
	Section No. 4				
	GROUND FLOOR				

FIRST FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 5</u>				
	<u>FIRST FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Steps				
A	Steps at auditorium	m3	168		
	Intermediate beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	1,012		
	Gutter beams				
D	Gutter Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	45		
	Up stand beams				
E	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	78		
	Columns				
F	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
G	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
H	450 mm thick	m3	142		
	Suspended solid floor slab				
I	250 mm thick ; horizontal	m2	4,100		
J	100mm thick solid slab	m2	400		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,500		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	612		
C	Girth 75mm to 150mm	m	79		
	Risers of steps				
D	Girth 225mm to 300mm	m	377		
	To vertical or battering sides				
E	Columns or the like; vertical and curved	m2	1,040		
F	Circular curved columns	m2	530		
G	Vertical sides of shear walls; curved to required radii	m2	500		
H	Edges of shear walls ditto	m2	10		
I	Vertical sides of lift shaft walls	m2	632		
J	Edges of lift shaft walls	m	19		
K	Vertical sides and soffits of beams; curved to required radii	m2	5,412		
L	Vertical sides of upstand beams; horizontal;ditto	m2	544		
M	Vertical sides of intermediate beams;ditto	m2	550		
N	Stepped sides of moulded gutter beams;2 no steps 1no chamfer; overall 1950mm girth	m2	223		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
O	Assorted sizes(T8-T40mm bars)	kg	463,264		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
A	To 100mm thick solid slab	m2	400		
	EXPANSION JOINTS				
B	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
C	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
D	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
E	350 x 350 x 12mm SHS	Kg	20,500		
F	150 x 150 x 6mm SHS	Kg	17,500		
	Sundries				
G	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	50		
H	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	80		
I	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	180		
J	16mm dia x 500mm long bolt; complete with nut and washers	No	1,080		
K	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	602		
L	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	400		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
M	General surface of steel members	m2	611		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/1 5/2 5/3		
	TOTAL FOR FIRST FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED				
	Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	28		
B	250 mm thick concrete landings	m2	76		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	6,110		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	354		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	113		
	To soffits; horizontal				
G	Landing	m2	76		
	Soffits; sloping				
H	Waists of stairs and the like	m2	104		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>METAL WORK</p> <p>BALUSTRADES</p> <p>ROLLED PLATES, BARS, SECTIONS AND TUBES</p> <p>GLASS BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval</p>				
A	1150 mm high to detail	m	41		
	<p>STAINLESS STEEL BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval</p>				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	354		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	102		
C	To risers; 150 mm high full length slab	m	354		
D	To landing; tiles to approved sizes and pattern	m2	76		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	51		
C	Ditto to edges of landing; 250mm high full length slab	m	113		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	163		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	354		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 40 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	354		
I	Risers; 150 mm high; internal	m	354		
J	Landing	m2	76		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
C	To open edges of landing Girth 225 to 300mm; internal	m	113		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
G	To open edges of landing Girth 225 to 300mm; internal	m	113		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/5 5/6 5/7 5/8		
	TOTAL FOR FIRST FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	4,202		
B	150mm thick walls	m2	393		
C	100mm thick walls	m2	200		
	<u>OPERABLE PARTITIONS</u>				
	100mm thick operable partitions; comprising equal panels size 1150x4200mm; including 1st substrate 18ga galvanized steel sheet and 2nd substrate 12mm gypsum board (both sides) with 45kg/m ³ Rockwool infill; with Bottom retractable seal to match MT01 and top retractable seal and 25mm nominal clearance; pivoted on carrier track Type 40 which is fixed on 160x75x8mm fixing plate supported by 10mmØ hanger rods which are bolted to an I- beam anchored to the soffits of the structural concrete beam; finished with Xorel Acoustical Panel Textile Wallcovering Nexus 6425, code 905 (WC 15) and Stainless steel PVD gold ion coated hairline strips (MT05); by HUF COR or equal and approved supplier; as per architectural details				
D	100mm thick partions	m2	180		
	<u>HDF PARTITIONS</u>				
E	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	120		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	162		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	282		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	150		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/10		
			5/11		
	TOTAL FOR FIRST FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ELEMENT NO 4</p> <p>EXTERNAL WALLING</p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	1,228		
	<p>TOTAL FOR FIRST FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 5</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	388		
B	Ditto transomes	m	66		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	287		
D	Ditto transomes	m	17		
	Architraves				
E	75 x 25 mm moulded	m	675		
	Quadrants				
F	25 x 25 mm	m	675		
	Beading; To fanlight				
G	25 x 25 mm	m	211		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	287		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	287		
	WPC Door Quadrants				
J	50 x 25 mm	m	287		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	4		
B	Sliding door overall size 2000 mm wide x 2700 mm high	No	25		
C	Ditto overall size 1500 mm wide x 2700 mm high	No	17		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	21		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	18		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	33		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	5		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	21		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC DOOR				
	30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.				
A	Double leaf door overall size 1500 mm wide x 2700 mm high	No	2		
	FRAMELESS GLASS DOOR				
	12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details				
B	Sliding door; Overall size 3500 x 2700mm high	No	1		
C	Ditto overall size 3000 x 2700mm high	No	3		
	12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door with screwed to concrete beam with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval				
D	Double leaf door; Overall size 3000 x 2700mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	<u>SECURITY DOOR</u>				
	Supply and fix the following high security door selected from "Assa Abloy" catalogue or other equal and approved; comprising of fully G.I steel framework; leaf made of 1.5mm thick G.I plates on both sides welded to G.I internal framework; in filled with rockwool and gypsum powder; finished in mahogany veneer; UV resistant and fire rated; including rubber surround seal and all necessary high security ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
B	Single leaf door overall size 1000 mm wide x 2700 mm high	No	1		
	<u>IRONMONGERY</u>				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
B	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	117.0		
C	Dltto 100mmx3.25mm	Pairs	121.5		
D	150mm heavy duty double action spring hinges	Pairs	8		
E	32x600mm high satin stainless steel straight pull handles back to back to approval	No	289		
F	Stainless steel push plate-100x300mm	No	289		
G	Stainless steel pull plate-100x300mm	No	289		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	19x225mm high S.S conceal fix pull handles	No	289		
B	Stainless steel Abbloy handles on Rose	No	86		
C	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	86		
D	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	21		
E	5-Lever mortice lock complete with aluminium lever handles	No	56		
F	Satin Nickel 70mm Euro restricted Double cylinder	No	56		
G	Oval satin nickel floor mounted door stop fixed with screw to approval	No	150		
H	800 x 200mm high stainless steel kick plate onto both sides to approval	No	208		
I	Satin steel Euro profile escutcheons	No	56		
J	Assa Abbloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	115		
K	Coat and hat hook with rubber tip in stainless steel finish	No	39		
L	Indicator lock 'Vacant / Engaged'	No	37		
M	Indicator lock 'Vacant / Engaged'-disabled	No	2		
N	200x300mm high stainless steel transfer grills	No	208		
O	Door viewer	No	17		
P	Door guard wish bone tye satin finish	No	17		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	675		
D	Door frame; girth 100 mm to 200 mm	m	287		
E	Architraves girth not exceeding 100 mm	m	962		
F	Quadrants/Beading girth not exceeding 100 mm	m	962		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	1,045		
H	Architraves girth 100 mm to 200mm	m	1,249		
I	Quadrants/beading girth not exceeding 100 mm	m	886		
J	General surfaces of wood	m2	577		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	25		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/14 5/15 5/16 5/17 5/18 5/19 5/20 5/21		
	TOTAL FOR FIRST FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	20		
B	Window overall size 1500 x 2700 mm high	No	6		
C	Window overall size 1500 x 1500 mm high	No	3		
D	Window overall size 1500 x 1500 mm high-sliding	No	17		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
E	250 x 25mm Window board	m	98		
F	20 x 25mm Quadrant beading	m	98		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	300mm girth	m	98		
B	Ditto: 0-100 mm girth	m	98		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	98		
D	Ditto: 0-100 mm girth	m	98		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	396		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	69		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/23		
			5/24		
TOTAL FOR FIRST FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	9,040		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,291		
E	Ditto to receive timber wall panelling	m2	619		
F	Ditto to receive acoustic foam padding	m2	340		
F	Ditto to receive acoustic panels	m2	172		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Walls; vertical; internal	m2	1,806		
H	Extra over for 100 mm wide decorative tile to approval	m	417		
I	Aluminium edging strip to corners of granito tiled walls	m	351		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	55		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TIMBER PANELLING				
	25mm thick solid mahogany panels with grooves; fixed to masonry/concrete surfaces on and including 50x25mm softwood timber framework; 150x50mm thick mahogany moulded beading to edges of panels; complete with 100x25mm thick mahogany architraves at top and middle; secret nailing; priming to surfaces in contact with wall				
E	To plastered surfaces	m2	619		
F	Allow for customization of the timber panelling to employer's requirements; all to architect's details	Item	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ACOUSTIC FOAM PADDING</u>				
	Supply and fix acoustic foam padding to walls comprising of 50mm thick compressed high density foam from Jumbo Chem Kenya Ltd or other equal and approved; fixed on and including 6mm thick high quality plywood nailed on and including 50x50mm thick cypress framework; complete with high quality leather with buttons as cover to compressed hexafoam; complete with and including 75x50mm thick varnished mahogany moulded beadings between foam paddings at horizontal and vertical at 500mm centres; secret nailing; including varnishing frames to approval				
A	To plastered surfaces	m2	340		
	<u>ACOUSTIC PANELS</u>				
B	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	172		
	<u>PAINTING AND DECORATING</u>				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
C	Walls; vertical; internal	m2	9,040		
D	Columns; vertical; internal	m2	1,623		
E	Gypsum partitions	m2	300		
F	Lift shaft and shear walls internally	m2	826		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	General surfaces of wood	m2	619		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			5/26		
			5/27		
			5/28		
TOTAL FOR FIRST FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	296		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	1,228		
B	Ditto to beams	m2	755		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	1,228		
D	To plastered beams	m2	755		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)				
E	Generally to columns	m2	51		
	Granite column finish Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
F	To plastered columns	m2	51		
G	25 x 15 mm solid brass decorative strip to tiled walls	m	34		
	INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)				
A	Generally to concrete upstands	m2	214		
	Granite upstand finish Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
B	To plastered concrete upstands	m2	214		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	<p>Curtain walling generally; diagonal sections; curved to profile</p> <p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>	m2	1,200		
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			5/30		
			5/31		
			5/32		
	TOTAL FOR FIRST FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	415		
B	Ditto to receive granite tiles	m2	329		
C	Ditto to receive porcelain tiles	m2	130		
D	Ditto to receive carpet	m2	1,737		
E	Ditto to receive carpet tiles	m2	507		
F	Ditto to receive engineered wood flooring	m2	154		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Floors; level; internal;	m2	415		
H	18 mm thick x 150mm high skirting; floor; internal	m	476		
I	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
J	Floors; level; internal;	m2	329		
K	25 mm thick x 150mm high skirting; floor; internal	m	178		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
A	Floors; level; internal;	m2	130		
B	18 mm thick x 150mm high skirting; floor; internal	m	176		
C	25 x 15 mm solid brass decorative strip to tiled floor	m	100		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
D	To screeded floor	m2	1,737		
	<p>Mahogany timber skirting</p>				
E	150 x 25mm thick moulded timber skirting	m	685		
	<p>Carpet tiles</p> <p>Supply and install 600 x 600mm wide carpet tiles from an appoved supplier; complete with and including floor underlay ; all to architect's specifications and approval</p>				
F	To screeded floor	m2	507		
G	150 x 25mm thick moulded mahogany timber skirting	m	63		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Engineered wood flooring				
	Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval				
A	To screeded floor	m2	154		
B	150 x 25mm thick moulded mahogany timber skirting	m	194		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Surfaces over 100mm but not exceeding 200mm girth	m	879		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
D	Timber surfaces between 100-200 mm girth	m	879		
E	To general timber surfaces	m2	154		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			5/34		
			5/35		
			5/36		
	TOTAL FOR FIRST FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 10</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	523		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	523		
C	18 mm thick x 150mm high skirting; floor;external	m	440		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	681		
B	Gutters	m2	200		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastick smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
C	Floors; horizontal; over 300 mm	m2	681		
D	Gutters	m2	200		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
F	210mm diameter rainwater downpipe: fixed to wall using brackets	m	80		
	Extra for:				
G	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	20		
H	Rainwater shoe	No	20		
I	Rainwater outlets: 210mm diameter	No	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	20		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	20		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/38 5/39 5/40		
TOTAL FOR FIRST FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5					<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,737		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in oval,circular,square and rectangular shape etc	m	1,500		
C	Moisture resistant gypsum ceiling	m2	125		
C	Cornices 150 x 25 mm polyurethane cornice	m	1,679		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	150		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	100		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	73		
G	Sides of beams; horizontal; Internal	m2	4,802		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	73		
B	Beams; horizontal; Internal	m2	4,802		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	3,487		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	186		
E	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/42		
			5/43		
TOTAL FOR FIRST FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	161		
B	Sides of beams; horizontal; external	m2	343		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	161		
D	Beams; horizontal; external	m2	343		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/45		
TOTAL FOR FIRST FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 5					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	81		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	186		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	81		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 4200mm x 600mm wide x 900mm high	No	2		
E	Ditto :average length 4000mm x 600mm wide x 900mm high	No	2		
F	Ditto :average length 2500mm x 600mm wide x 900mm high	No	2		
G	Ditto :average length 1700mm x 600mm wide x 900mm high	No	17		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.				
C	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	31		
D	20 x 100 mm granite fascia	m	51		
	Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details				
E	Low level cabinet overall size :overall length 4000mm x 600mm wide x 900mm high at kitchenette	No	1		
	Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.				
F	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	3		
G	20 x 100 mm granite fascia	m	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p>				
A	High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high	No	1		
	<p>Shelving at stores / house keeping</p>				
B	5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets	m	32		
	<p>Wardrobes</p> <p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
C	Wardrobes overall size 2500 x 600mm wide x 4300mm high	No	17		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sliding glass shower cubicle comprising of 12mm thick toughened glass size 1500 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	17		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 5/47 5/48 5/49 5/50		
TOTAL FOR FIRST FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 5					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	<u>ALUMINIUM COMPOSITE CLADDING</u>				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	740		
	TOTAL FOR FIRST FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 15</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc				
A	Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces	Item	1		
	TOTAL FOR FIRST FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 5				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 5				
	FIRST FLOOR				
	<u>SECTION SUMMARY- FIRST FLOOR</u>				
1	FRAME	Page	5/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	5/9		
3	INTERNAL WALLING	Page	5/12		
4	EXTERNAL WALLING	Page	5/13		
5	DOORS AND ASSOCIATED FINISHES	Page	5/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	5/25		
7	INTERNAL WALL FINISHES	Page	5/29		
8	EXTERNAL WALL FINISHES	Page	5/32		
9	INTERNAL FLOOR FINISHES	Page	5/37		
10	EXTERNAL FLOOR FINISHES	Page	5/41		
11	INTERNAL CEILING FINISHES	Page	5/44		
12	EXTERNAL CEILING FINISHES	Page	5/46		
13	FITTINGS	Page	5/50		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	5/52		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	5/53		
	Carried to Final Summary				
	Section No. 5				
	FIRST FLOOR				

SECOND FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 6</u>				
	<u>SECOND FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Steps				
A	Steps at galleries	m3	89		
	Intermediate beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	926		
	Gutter beams				
D	Gutter Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	45		
	Up stand beams				
E	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	51		
	Columns				
F	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
G	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
H	450 mm thick	m3	142		
	Suspended solid floor slab				
I	250 mm thick ; horizontal	m2	3,300		
J	100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,500		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	515		
C	Girth 75mm to 150mm	m	187		
	Risers of steps				
D	Girth 225mm to 300mm	m	166		
	To vertical or battering sides				
E	Columns or the like; vertical and curved	m2	1,040		
F	Circular curved columns	m2	530		
G	Vertical sides of shear walls; curved to required radii	m2	500		
H	Edges of shear walls ditto	m2	10		
I	Vertical sides of lift shaft walls	m2	632		
J	Edges of lift shaft walls	m	19		
K	Vertical sides and soffits of beams; curved to required radii	m2	5,697		
L	Vertical sides of upstand beams; horizontal;ditto	m2	349		
M	Vertical sides of intermediate beams;ditto	m2	550		
N	Stepped sides of moulded gutter beams;2 no steps 1no chamfer; overall 1950mm girth	m2	223		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
O	Assorted sizes(T8-T40mm bars)	kg	411,134		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
A	To 100mm thick solid slab	m2	1,200		
	EXPANSION JOINTS				
B	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
C	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
D	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
E	350 x 350 x 12mm SHS	Kg	47,930		
F	150 x 150 x 6mm SHS	Kg	45,937		
	Sundries				
G	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	106		
H	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	192		
I	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	516		
J	16mm dia x 500mm long bolt; complete with nut and washers	No	2,872		
K	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	1,700		
L	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	1,200		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
M	General surface of steel members	m2	1,545		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/1 6/2 6/3		
	TOTAL FOR SECOND FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED				
	Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	28		
B	250 mm thick concrete landings	m2	76		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	6,110		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	354		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	113		
	To soffits; horizontal				
G	Landing	m2	76		
	Soffits; sloping				
H	Waists of stairs and the like	m2	104		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	41		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	354		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	102		
C	To risers; 150 mm high full length slab	m	354		
D	To landing; tiles to approved sizes and pattern	m2	76		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	51		
C	Ditto to edges of landing; 250mm high full length slab	m	113		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	163		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	354		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 40 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	354		
I	Risers; 150 mm high; internal	m	354		
J	Landing	m2	76		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
C	To open edges of landing Girth 225 to 300mm; internal	m	113		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
G	To open edges of landing Girth 225 to 300mm; internal	m	113		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/5 6/6 6/7 6/8		
	TOTAL FOR SECOND FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laide horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	2,903		
B	150mm thick walls	m2	436		
C	100mm thick walls	m2	172		
	<u>OPERABLE PARTITIONS</u>				
	100mm thick operable partitions; comprising equal panels size 1150x4200mm; including 1st substrate 18ga galvanized steel sheet and 2nd substrate 12mm gypsum board (both sides) with 45kg/m ³ Rockwool infill; with Bottom retractable seal to match MT01 and top retractable seal and 25mm nominal clearance; pivoted on carrier track Type 40 which is fixed on 160x75x8mm fixing plate supported by 10mmØ hanger rods which are bolted to an I- beam anchored to the soffits of the structural concrete beam; finished with Xorel Acoustical Panel Textile Wallcovering Nexus 6425, code 905 (WC 15) and Stainless steel PVD gold ion coated hairline strips (MT05); by HUF COR or equal and approved supplier; as per architectural details				
D	100mm thick partions	m2	155		
	<u>HDF PARTITIONS</u>				
E	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	110		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	152		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	262		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	120		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/10		
			6/11		
TOTAL FOR SECOND FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 6					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ELEMENT NO 4</p> <p>EXTERNAL WALLING</p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	1,228		
<p>TOTAL FOR SECOND FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 6</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	520		
B	Ditto transomes	m	121		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	243		
D	Ditto transomes	m	12		
	Architraves				
E	75 x 25 mm moulded	m	763		
	Quadrants				
F	25 x 25 mm	m	763		
	Beading; To fanlight				
G	25 x 25 mm	m	315		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	243		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	243		
	WPC Door Quadrants				
J	50 x 25 mm	m	243		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	7		
B	Sliding door overall size 2000 mm wide x 2700 mm high	No	21		
C	Ditto overall size 1500 mm wide x 2700 mm high	No	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	14		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	17		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	45		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	5		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	14		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC DOOR				
	30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.				
A	Double leaf door overall size 1500 mm wide x 2700 mm high	No	1		
	FRAMELESS GLASS DOOR				
	12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details				
B	Sliding door; Overall size 2500 x 2700mm high	No	1		
	12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door with screwed to concrete beam with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval				
C	Double leaf door; Overall size 2400 x 2700mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DUCT DOORS				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
D	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	127.5		
E	Ditto 100mmx3.25mm	Pairs	111.0		
F	150mm heavy duty double action spring hinges	Pairs	8		
G	32x600mm high satin stainless steel straight pull handles back to back to approval	No	294		
H	Stainless steel push plate-100x300mm	No	294		
I	Stainless steel pull plate-100x300mm	No	294		
J	19x225mm high S.S conceal fix pull handles	No	294		
K	Stainless steel Abbloy handles on Rose	No	97		
A	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	97		
B	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	14		
C	5-Lever mortice lock complete with aluminium lever handles	No	67		
D	Satin Nickel 70mm Euro restricted Double cylinder	No	67		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Oval satin nickel floor mounted door stop fixed with screw to approval	No	158		
B	800 x 200mm high stainless steel kick plate onto both sides to approval	No	208		
C	Satin steel Euro profile escutcheons	No	67		
D	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	123		
E	Coat and hat hook with rubber tip in stainless steel finish	No	32		
F	Indicator lock 'Vacant / Engaged'	No	30		
G	Indicator lock 'Vacant / Engaged'-disabled	No	2		
H	200x300mm high stainless steel transfer grills	No	208		
I	Door viewer	No	17		
J	Door guard wish bone tye satin finish	No	17		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	763		
D	Door frame; girth 100 mm to 200 mm	m	243		
E	Architraves girth not exceeding 100 mm	m	1,006		
F	Quadrants/Beading girth not exceeding 100 mm	m	1,006		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	1,139		
H	Architraves girth 100 mm to 200mm	m	1,249		
I	Quadrants/beading girth not exceeding 100 mm	m	1,078		
J	General surfaces of wood	m2	845		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	40		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/14 6/15 6/16 6/17 6/18 6/19 6/20 6/21		
	TOTAL FOR SECOND FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	20		
B	Window overall size 2700 x 2000 mm high-sliding	No	7		
C	Window overall size 1500 x 1500 mm high-sliding	No	17		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
D	250 x 25mm Window board	m	102		
E	20 x 25mm Quadrant beading	m	102		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	102		
B	Ditto: 0-100 mm girth	m	102		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	102		
D	Ditto: 0-100 mm girth	m	102		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	400		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	48		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/23		
			6/24		
	TOTAL FOR SECOND FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 7				
	INTERNAL WALL FINISHES				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	7,013		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,023		
E	Ditto to receive timber wall panelling	m2	306		
F	Ditto to receive acoustic foam padding	m2	261		
G	Ditto to receive acoustic panels	m2	150		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Walls; vertical; internal	m2	1,485		
I	Extra over for 100 mm wide decorative tile to approval	m	303		
J	Aluminium edging strip to corners of granito tiled walls	m	296		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	63		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	To waterfeature	m2	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	TIMBER PANELLING				
	25mm thick solid mahogany panels with grooves; fixed to masonry/concrete surfaces on and including 50x25mm softwood timber framework; 150x50mm thick mahogany moulded beading to edges of panels; complete with 100x25mm thick mahogany architraves at top and middle; secret nailing; priming to surfaces in contact with wall				
A	To plastered surfaces	m2	306		
B	Allow for customization of the timber panelling to employer's requirements; all to architect's details	Item	1		
	ACOUSTIC FOAM PADDING				
	Supply and fix acoustic foam padding to walls comprising of 50mm thick compressed high density foam from Jumbo Chem Kenya Ltd or other equal and approved; fixed on and including 6mm thick high quality plywood nailed on and including 50x50mm thick cypress framework; complete with high quality leather with buttons as cover to compressed hexafoam; complete with and including 75x50mm thick varnished mahogany moulded beadings between foam paddings at horizontal and vertical at 500mm centres; secret nailing; including varnishing frames to approval				
C	To plastered surfaces	m2	261		
	ACOUSTIC PANELS				
D	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	150		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
A	Walls; vertical; internal	m2	7,013		
B	Columns; vertical; internal	m2	1,623		
C	Gypsum partitions	m2	240		
D	Lift shaft and shear walls internally	m2	826		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
E	General surfaces of wood	m2	306		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/26 6/27 6/28 6/29		
TOTAL FOR SECOND FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6					_____ _____

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 8</u>				
	<u>EXTERNAL WALL FINISHES</u>				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	296		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	1,228		
B	Ditto to beams	m2	592		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	1,228		
D	To plastered beams	m2	592		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to columns</p> <p>Granite column finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	51		
B	To plastered columns	m2	51		
C	25 x 15 mm solid brass decorative strip to tiled walls	m	34		
D	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	137		
E	To plastered concrete upstands	m2	137		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	<p>Curtain walling generally; diagonal sections; curved to profile</p> <p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>	m2	1,200		
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			6/30		
			6/31		
			6/32		
	TOTAL FOR SECOND FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	454		
B	Ditto to receive granite tiles	m2	391		
D	Ditto to receive porcelain tiles	m2	690		
E	Ditto to receive carpet	m2	877		
F	Ditto to receive carpet tiles	m2	417		
G	Ditto to receive engineered wood flooring	m2	161		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Floors; level; internal;	m2	454		
I	18 mm thick x 150mm high skirting; floor; internal	m	470		
J	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
K	Floors; level; internal;	m2	391		
L	20 mm thick x 150mm high skirting; floor; internal	m	172		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
A	Floors; level; internal;	m2	690		
B	18 mm thick x 150mm high skirting; floor; internal	m	500		
C	25 x 15 mm solid brass decorative strip to tiled floor	m	100		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
D	To screeded floor	m2	877		
	<p>Mahogany timber skirting</p>				
E	150 x 25mm thick moulded timber skirting	m	501		
	<p>Carpet tiles</p> <p>Supply and install 600 x 600mm wide carpet tiles from an appoved supplier; complete with and including floor underlay ; all to architect's specifications and approval</p>				
F	To screeded floor	m2	417		
G	150 x 25mm thick moulded mahogany timber skirting	m	112		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Engineered wood flooring				
	Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval				
A	To screeded floor	m2	161		
B	150 x 25mm thick moulded mahogany timber skirting	m	193		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Surfaces over 100mm but not exceeding 200mm girth	m	806		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
D	Timber surfaces between 100-200 mm girth	m	806		
E	To general timber surfaces	m2	161		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			6/34		
			6/35		
			6/36		
	TOTAL FOR SECOND FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	526		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	526		
C	18 mm thick x 150mm high skirting; floor;external	m	456		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	635		
B	Gutters	m2	200		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
C	Floors; horizontal; over 300 mm	m2	635		
D	Gutters	m2	200		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
F	210mm diameter rainwater downpipe: fixed to wall using brackets	m	40		
	Extra for:				
G	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	20		
H	Rainwater shoe	No	20		
I	Rainwater outlets: 210mm diameter	No	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	20		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	20		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			6/38		
			6/39		
			6/40		
	TOTAL FOR SECOND FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,365		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,021		
C	Moisture resistant gypsum ceiling	m2	115		
D	Cornices 150 x 25 mm polyurethane cornice	m	1,876		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
E	Horizontal ceiling ; internal	m2	98		
F	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	50		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
G	Ceiling and soffits of beams; horizontal; internal	m2	152		
H	Sides of beams; horizontal; Internal	m2	5,453		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	125		
B	Beams; horizontal; Internal	m2	5,453		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	2,876		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	153		
E	Ditto perforated for backlighting	m2	120		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/43		
			6/44		
	TOTAL FOR SECOND FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	52		
B	Sides of beams; horizontal; external	m2	269		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	52		
D	Beams; horizontal; external	m2	269		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ROOF SKYLIGHTS</u></p> <p>Supply and fix 18mm thick toughened safety glass (6mm+6mm+6mm) as supplied by Impala Glass Industries Kenya Ltd or other equal and approved; including polyvinyl butuyral (PVB) film solar glass fixed on and including 75x75x3mm thick SHS mild steel trusses finished in zinc chromate primer and two coats of gloss oil paint; fixed in accordance with manufacturer's recommendations as described on:-</p>				
A	To skylight at break	m2	25		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 6/46		
			6/47		
	TOTAL FOR SECOND FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 6				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	79		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	200		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	79		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 4200mm x 600mm wide x 900mm high	No	2		
E	Ditto :average length 1700mm x 600mm wide x 900mm high	No	17		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.				
A	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	23		
B	20 x 100 mm granite fascia	m	38		
	Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details				
C	Low level cabinet overall size :overall length 4000mm x 600mm wide x 900mm high at kitchenette	No	1		
	Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.				
D	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	3		
E	20 x 100 mm granite fascia	m	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p>				
A	<p>High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high</p>	No	1		
	<p>Shelving at stores / linen</p>				
B	<p>5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	48		
	<p>Wardrobes</p> <p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
C	<p>Wardrobes overall size 2500 x 600mm wide x 4300mm high</p>	No	17		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	12mm thick toughened glass comprising of 12mm thick toughened glass size 1500 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	17		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			6/49		
			6/50		
			6/51		
			6/52		
TOTAL FOR SECOND FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 6					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	<u>ALUMINIUM COMPOSITE CLADDING</u>				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	740		
TOTAL FOR SECOND FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 6					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 15</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	<p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
<p>TOTAL FOR SECOND FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 6</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 6				
	SECOND FLOOR				
	<u>SECTION SUMMARY- SECOND FLOOR</u>				
1	FRAME	Page	6/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	6/9		
3	INTERNAL WALLING	Page	6/12		
4	EXTERNAL WALLING	Page	6/13		
5	DOORS AND ASSOCIATED FINISHES	Page	6/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	6/25		
7	INTERNAL WALL FINISHES	Page	6/30		
8	EXTERNAL WALL FINISHES	Page	6/33		
9	INTERNAL FLOOR FINISHES	Page	6/38		
10	EXTERNAL FLOOR FINISHES	Page	6/42		
11	INTERNAL CEILING FINISHES	Page	6/45		
12	EXTERNAL CEILING FINISHES	Page	6/48		
13	FITTINGS	Page	6/53		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	6/54		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	6/55		
	Carried to Final Summary				
	Section No. 6				
	SECOND FLOOR				

THIRD FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 7</u>				
	<u>THIRD FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Steps				
A	Steps at depating chambers	m3	147		
	Intermediate beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	1,034		
	Up stand beams				
D	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	51		
	Columns				
E	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
F	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
G	450 mm thick	m3	142		
	Suspended solid floor slab				
H	250 mm thick ; horizontal	m2	4,100		
I	100mm thick solid slab	m2	400		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,500		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	594		
C	Girth 75mm to 150mm	m	79		
	Risers of steps				
D	Girth 225mm to 300mm	m	276		
	To vertical or battering sides				
E	Columns or the like; vertical and curved	m2	1,040		
F	Circular curved columns	m2	530		
G	Vertical sides of shear walls; curved to required radii	m2	500		
H	Edges of shear walls ditto	m2	10		
I	Vertical sides of lift shaft walls	m2	632		
J	Edges of lift shaft walls	m	19		
K	Vertical sides and soffits of beams; curved to required radii	m2	5,402		
L	Vertical sides of upstand beams; horizontal;ditto	m2	355		
M	Vertical sides of intermediate beams;ditto	m2	550		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
N	Assorted sizes(T8-T40mm bars)	kg	451,794		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
O	To 100mm thick solid slab	m2	400		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXPANSION JOINTS				
A	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
B	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
C	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
D	350 x 350 x 12mm SHS	Kg	20,500		
E	150 x 150 x 6mm SHS	Kg	17,500		
	Sundries				
F	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	50		
G	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	80		
H	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	180		
I	16mm dia x 500mm long bolt; complete with nut and washers	No	1,080		
J	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	602		
K	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	400		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
L	General surface of steel members	m2	611		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/1 7/2 7/3		
	TOTAL FOR THIRD FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	36		
B	250 mm thick concrete landings	m2	90		
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	7,605		
	FORMWORK TO INSITU CONCRETE Formwork generally Risers of steps and staircases				
D	Girth 75m m to 150mm	m	444		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	71		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	134		
	To soffits; horizontal				
G	Landing	m2	90		
	Soffits; sloping				
H	Waists of stairs and the like	m2	134		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	60		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	80		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	444		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	142		
C	To risers; 150 mm high full length slab	m	444		
D	To landing; tiles to approved sizes and pattern	m2	90		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	71		
C	Ditto to edges of landing; 250mm high full length slab	m	134		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	205		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	444		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 40 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	444		
I	Risers; 150 mm high; internal	m	444		
J	Landing	m2	90		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	71		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	134		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	90		
C	To open edges of landing Girth 225 to 300mm; internal	m	134		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	71		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	134		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	90		
G	To open edges of landing Girth 225 to 300mm; internal	m	134		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	71		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			7/5		
			7/6		
			7/7		
			7/8		
	TOTAL FOR THIRD FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	2,670		
B	150mm thick walls	m2	436		
C	100mm thick walls	m2	172		
	<u>HDF PARTITIONS</u>				
D	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	331		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	162		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	493		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	120		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/10		
			7/11		
	TOTAL FOR THIRD FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ELEMENT NO 4</p> <p>EXTERNAL WALLING</p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	1,228		
	<p>TOTAL FOR THIRD FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 7</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	381		
B	Ditto transomes	m	65		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	293		
D	Ditto transomes	m	18		
	Architraves				
E	75 x 25 mm moulded	m	674		
	Quadrants				
F	25 x 25 mm	m	674		
	Beading; To fanlight				
G	25 x 25 mm	m	212		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	293		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	293		
	WPC Door Quadrants				
J	50 x 25 mm	m	293		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	8		
B	Ditto overall size 1500 mm wide x 2700 mm high	No	2		
C	Ditto overall size 900 mm wide x 2700 mm high	No	8		
D	Sliding door overall size 2000 mm wide x 2700 mm high	No	24		
E	Ditto overall size 1500 mm wide x 2700 mm high	No	18		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	14		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	18		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	32		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	6		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	22		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ACOUSTIC DOOR</p> <p>30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.</p> <p>Double leaf door overall size 1500 mm wide x 2700 mm high</p>	No	2		
B	<p>FRAMELESS GLASS DOOR</p> <p>12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details</p> <p>Sliding door; Overall size 3000 x 2700mm high</p>	No	1		
C	<p>12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door with screwed to concrete beam with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval</p> <p>Double leaf door; Overall size 3000 x 2700mm high</p>	No	1		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
B	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	114.0		
C	Ditto 100mmx3.25mm	Pairs	123.0		
D	150mm heavy duty double action spring hinges	Pairs	9		
E	32x600mm high satin stainless steel straight pull handles back to back to approval	No	234		
F	Stainless steel push plate-100x300mm	No	234		
G	Stainless steel pull plate-100x300mm	No	234		
H	19x225mm high S.S conceal fix pull handles	No	234		
I	Stainless steel Abbloy handles on Rose	No	86		
J	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	86		
K	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	22		
L	5-Lever mortice lock complete with aluminium lever handles	No	56		
M	Satin Nickel 70mm Euro restricted Double cylinder	No	56		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Oval satin nickel floor mounted door stop fixed with screw to approval	No	171		
B	800 x 200mm high stainless steel kick plate onto both sides to approval	No	208		
C	Satin steel Euro profile escutcheons	No	56		
D	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	123		
E	Coat and hat hook with rubber tip in stainless steel finish	No	42		
F	Indicator lock 'Vacant / Engaged'	No	40		
G	Indicator lock 'Vacant / Engaged'-disabled	No	2		
H	200x300mm high stainless steel transfer grills	No	208		
I	Door viewer	No	19		
J	Door guard wish bone tye satin finish	No	19		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	674		
D	Door frame; girth 100 mm to 200 mm	m	293		
E	Architraves girth not exceeding 100 mm	m	967		
F	Quadrants/Beading girth not exceeding 100 mm	m	967		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	1,050		
H	Architraves girth 100 mm to 200mm	m	1,260		
I	Quadrants/beading girth not exceeding 100 mm	m	886		
J	General surfaces of wood	m2	578		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	25		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/14 7/15 7/16 7/17 7/18 7/19 7/20 7/21		
	TOTAL FOR THIRD FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	15		
B	Window overall size 1500 x 1500 mm high-sliding	No	19		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
C	250 x 25mm Window board	m	72		
D	20 x 25mm Quadrant beading	m	72		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	72		
B	Ditto: 0-100 mm girth	m	72		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	72		
D	Ditto: 0-100 mm girth	m	72		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	545		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	48		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/23		
			7/24		
TOTAL FOR THIRD FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 7				
	INTERNAL WALL FINISHES				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	5,179		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,594		
E	Ditto to receive timber wall panelling	m2	748		
F	Ditto to receive acoustic foam padding	m2	426		
G	Ditto to receive acoustic panels	m2	87		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Walls; vertical; internal	m2	2,092		
I	Extra over for 100 mm wide decorative tile to approval	m	440		
J	Aluminium edging strip to corners of granito tiled walls	m	335		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	72		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TIMBER PANELLING				
	25mm thick solid mahogany panels with grooves; fixed to masonry/concrete surfaces on and including 50x25mm softwood timber framework; 150x50mm thick mahogany moulded beading to edges of panels; complete with 100x25mm thick mahogany architraves at top and middle; secret nailing; priming to surfaces in contact with wall				
E	To plastered surfaces	m2	748		
F	Allow for customization of the timber panelling to employer's requirements; all to architect's details	Item	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC FOAM PADDING				
	Supply and fix acoustic foam padding to walls comprising of 50mm thick compressed high density foam from Jumbo Chem Kenya Ltd or other equal and approved; fixed on and including 6mm thick high quality plywood nailed on and including 50x50mm thick cypress framework; complete with high quality leather with buttons as cover to compressed hexafoam; complete with and including 75x50mm thick varnished mahogany moulded beadings between foam paddings at horizontal and vertical at 500mm centres; secret nailing; including varnishing frames to approval				
A	To plastered surfaces	m2	426		
	ACOUSTIC PANELS				
B	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	87		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
C	Walls; vertical; internal	m2	5,179		
D	Columns; vertical; internal	m2	1,623		
E	Gypsum partitions	m2	240		
F	Lift shaft and shear walls internally	m2	826		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	General surfaces of wood	m2	748		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			7/26		
			7/27		
			7/28		
TOTAL FOR THIRD FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	270		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
B	Generally to external walls	m2	1,228		
C	Ditto to beams	m2	428		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D	To plastered external walls	m2	1,228		
E	To plastered beams	m2	428		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)				
A	Generally to concrete upstands	m2	139		
	Granite upstand finish				
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
B	To plastered concrete upstands	m2	139		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	Curtain walling generally; diagonal sections; curved to profile	m2	1,200		
	<p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>				
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			7/30		
			7/31		
			7/32		
	TOTAL FOR THIRD FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	490		
B	Ditto to receive granite tiles	m2	730		
D	Ditto to receive porcelain tiles	m2	235		
E	Ditto to receive carpet	m2	2,019		
F	Ditto to receive engineered wood flooring	m2	193		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Floors; level; internal;	m2	490		
H	18 mm thick x 150mm high skirting; floor; internal	m	546		
I	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
J	Floors; level; internal;	m2	730		
K	20 mm thick x 150mm high skirting; floor; internal	m	307		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
A	Floors; level; internal;	m2	235		
B	18 mm thick x 150mm high skirting; floor; internal	m	211		
C	25 x 15 mm solid brass decorative strip to tiled floor	m	100		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
D	To screeded floor	m2	2,019		
	<p>Mahogany timber skirting</p>				
E	150 x 25mm thick moulded timber skirting	m	943		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Engineered wood flooring				
	Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval				
A	To screeded floor	m2	193		
B	150 x 25mm thick moulded mahogany timber skirting	m	181		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Surfaces over 100mm but not exceeding 200mm girth	m	1,124		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
D	Timber surfaces between 100-200 mm girth	m	1,124		
E	To general timber surfaces	m2	193		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			7/34		
			7/35		
			7/36		
TOTAL FOR THIRD FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 10</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	314		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	314		
C	18 mm thick x 150mm high skirting; floor;external	m	393		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	373		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Floors; horizontal; over 300 mm	m2	373		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	210mm diameter rainwater downpipe: fixed to wall using brackets	m	64		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	16		
F	Rainwater shoe	No	16		
G	Rainwater outlets: 210mm diameter	No	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	16		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	16		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			7/38		
			7/39		
			7/40		
TOTAL FOR THIRD FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,850		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,276		
C	Moisture resistant gypsum ceiling	m2	163		
C	Cornices 150 x 25 mm polyurethane cornice	m	1,956		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	209		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	105		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	77		
G	Sides of beams; horizontal; Internal	m2	4,754		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	77		
B	Beams; horizontal; Internal	m2	4,754		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	3,488		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	212		
E	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/42		
			7/43		
TOTAL FOR THIRD FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	52		
B	Sides of beams; horizontal; external	m2	195		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	52		
D	Beams; horizontal; external	m2	195		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/45		
TOTAL FOR THIRD FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 7					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	103		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	247		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	103		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 5200mm x 600mm wide x 900mm high	No	2		
E	Ditto :average length 4000mm x 600mm wide x 900mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Ditto :average length 2500mm x 600mm wide x 900mm high	No	2		
B	Ditto :average length 1700mm x 600mm wide x 900mm high Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.	No	19		
C	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	34		
D	20 x 100 mm granite fascia Cabinets Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details	m	56		
E	Low level cabinet overall size :overall length 4000mm x 600mm wide x 900mm high at kitchenette	No	2		
F	Ditto :average length 3600mm x 600mm wide x 900mm high	No	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.				
A	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	14		
B	20 x 100 mm granite fascia	m	23		
	High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery				
C	High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high	No	6		
	Shelving at stores				
D	5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets	m	46		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Wardrobes</p> <p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
A	Wardrobes overall size 2500 x 600mm wide x 4300mm high	No	19		
B	Sliding glass shower cubicle comprising of 12mm thick toughened glass size 1500 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	19		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 7/47 7/48 7/49 7/50		
	TOTAL FOR THIRD FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	ALUMINIUM COMPOSITE CLADDING				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	740		
	TOTAL FOR THIRD FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 15</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc				
A	Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces	Item	1		
	TOTAL FOR THIRD FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 7				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 7				
	THIRD FLOOR				
	<u>SECTION SUMMARY- THIRD FLOOR</u>				
1	FRAME	Page	7/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	7/9		
3	INTERNAL WALLING	Page	7/12		
4	EXTERNAL WALLING	Page	7/13		
5	DOORS AND ASSOCIATED FINISHES	Page	7/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	7/25		
7	INTERNAL WALL FINISHES	Page	7/29		
8	EXTERNAL WALL FINISHES	Page	7/33		
9	INTERNAL FLOOR FINISHES	Page	7/37		
10	EXTERNAL FLOOR FINISHES	Page	7/41		
11	INTERNAL CEILING FINISHES	Page	7/44		
12	EXTERNAL CEILING FINISHES	Page	7/46		
13	FITTINGS	Page	7/51		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	7/52		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	7/53		
	Carried to Final Summary				
	Section No. 7				
	THIRD FLOOR				

FOURTH FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 8</u>				
	<u>FOURTH FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Steps				
A	Steps at galleries	m3	83		
	Intermediate beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	710		
	Up stand beams				
D	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	51		
	Columns				
E	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
F	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
G	450 mm thick	m3	142		
	Suspended solid floor slab				
H	250 mm thick ; horizontal	m2	3,300		
I	100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,500		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	491		
C	Girth 75mm to 150mm	m	187		
	Risers of steps				
D	Girth 225mm to 300mm	m	156		
	To vertical or battering sides				
E	Columns or the like; vertical and curved	m2	1,040		
F	Circular curved columns	m2	530		
G	Vertical sides of shear walls; curved to required radii	m2	500		
H	Edges of shear walls ditto	m2	10		
I	Vertical sides of lift shaft walls	m2	632		
J	Edges of lift shaft walls	m	19		
K	Vertical sides and soffits of beams; curved to required radii	m2	4,778		
L	Vertical sides of upstand beams; horizontal;ditto	m2	355		
M	Vertical sides of intermediate beams;ditto	m2	550		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
N	Assorted sizes(T8-T40mm bars)	kg	358,514		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXPANSION JOINTS				
A	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
B	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
C	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
D	350 x 350 x 12mm SHS	Kg	47,930		
E	150 x 150 x 6mm SHS	Kg	45,937		
	Sundries				
F	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	106		
G	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	192		
H	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	516		
I	16mm dia x 500mm long bolt; complete with nut and washers	No	2,872		
J	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	1,700		
K	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	1,200		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
L	General surface of steel members	m2	1,545		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/1 8/2 8/3		
	TOTAL FOR FOURTH FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED				
	Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	36		
B	250 mm thick concrete landings	m2	90		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	7,605		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	444		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	71		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	134		
	To soffits; horizontal				
G	Landing	m2	90		
	Soffits; sloping				
H	Waists of stairs and the like	m2	134		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	60		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	80		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	444		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	142		
C	To risers; 150 mm high full length slab	m	444		
D	To landing; tiles to approved sizes and pattern	m2	90		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	71		
C	Ditto to edges of landing; 250mm high full length slab	m	134		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	205		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	444		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 20 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	444		
I	Risers; 150 mm high; internal	m	444		
J	Landing	m2	90		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	71		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	134		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	90		
C	To open edges of landing Girth 225 to 300mm; internal	m	134		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	71		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
E	To steel trowelled plastered surfaces Soffits of stairs; sloping Over 300mm girth; internal	m2	134		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	90		
G	To open edges of landing Girth 225 to 300mm; internal	m	134		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	71		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			8/5		
			8/6		
			8/7		
			8/8		
	TOTAL FOR FOURTH FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	2,869		
B	150mm thick walls	m2	436		
C	100mm thick walls	m2	255		
	<u>HDF PARTITIONS</u>				
D	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	150		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	290		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	440		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	120		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/10		
			8/11		
TOTAL FOR FOURTH FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 8					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ELEMENT NO 4</p> <p>EXTERNAL WALLING</p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	1,228		
<p>TOTAL FOR FOURTH FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 8</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	334		
B	Ditto transomes	m	52		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	268		
D	Ditto transomes	m	15		
	Architraves				
E	75 x 25 mm moulded	m	602		
	Quadrants				
F	25 x 25 mm	m	602		
	Beading; To fanlight				
G	25 x 25 mm	m	173		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	268		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	268		
	WPC Door Quadrants				
J	50 x 25 mm	m	268		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	8		
B	Ditto overall size 1500 mm wide x 2700 mm high	No	3		
C	Ditto overall size 900 mm wide x 2700 mm high	No	9		
D	Sliding door overall size 2000 mm wide x 2700 mm high	No	17		
E	Ditto overall size 1500 mm wide x 2700 mm high	No	24		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	18		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	7		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	37		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	6		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	18		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC DOOR				
	30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.				
A	Double leaf door overall size 1500 mm wide x 2700 mm high	No	2		
	FRAMELESS GLASS DOOR				
	12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details				
B	Sliding door; Overall size 3000 x 2700mm high	No	1		
	12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door with screwed to concrete beam with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval				
C	Double leaf door; Overall size 3000 x 2700mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DUCT DOORS				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
B	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	88.5		
C	Ditto 100mmx3.25mm	Pairs	117.0		
D	150mm heavy duty double action spring hinges	Pairs	9		
E	32x600mm high satin stainless steel straight pull handles back to back to approval	No	218		
F	Stainless steel push plate-100x300mm	No	218		
G	Stainless steel pull plate-100x300mm	No	218		
H	19x225mm high S.S conceal fix pull handles	No	218		
I	Stainless steel Abloy handles on Rose	No	80		
J	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	80		
K	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	18		
L	5-Lever mortice lock complete with aluminium lever handles	No	50		
M	Satin Nickel 70mm Euro restricted Double cylinder	No	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Oval satin nickel floor mounted door stop fixed with screw to approval	No	153		
B	800 x 200mm high stainless steel kick plate onto both sides to approval	No	166		
C	Satin steel Euro profile escutcheons	No	50		
D	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	102		
E	Coat and hat hook with rubber tip in stainless steel finish	No	31		
F	Indicator lock 'Vacant / Engaged'	No	29		
G	Indicator lock 'Vacant / Engaged'-disabled	No	2		
H	200x300mm high stainless steel transfer grills	No	166		
I	Door viewer	No	12		
J	Door guard wish bone tye satin finish	No	12		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	602		
D	Door frame; girth 100 mm to 200 mm	m	268		
E	Architraves girth not exceeding 100 mm	m	870		
F	Quadrants/Beading girth not exceeding 100 mm	m	870		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	937		
H	Architraves girth 100 mm to 200mm	m	1,138		
I	Quadrants/beading girth not exceeding 100 mm	m	775		
J	General surfaces of wood	m2	490		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/14 8/15 8/16 8/17 8/18 8/19 8/20 8/21		
	TOTAL FOR FOURTH FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	17		
B	Window overall size 2700 x 2000 mm high-sliding	No	4		
C	Window overall size 1500 x 1500 mm high-sliding	No	12		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
D	250 x 25mm Window board	m	76		
E	20 x 25mm Quadrant beading	m	76		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	76		
B	Ditto: 0-100 mm girth	m	76		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	76		
D	Ditto: 0-100 mm girth	m	76		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	497		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	48		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/23		
			8/24		
	TOTAL FOR FOURTH FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	6,399		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,357		
E	Ditto to receive timber wall panelling	m2	240		
F	Ditto to receive acoustic foam padding	m2	637		
G	Ditto to receive acoustic panels	m2	67		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Walls; vertical; internal	m2	1,819		
I	Extra over for 100 mm wide decorative tile to approval	m	410		
J	Aluminium edging strip to corners of granito tiled walls	m	310		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	63		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	To waterfeature	m2	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	TIMBER PANELLING				
	25mm thick solid mahogany panels with grooves; fixed to masonry/concrete surfaces on and including 50x25mm softwood timber framework; 150x50mm thick mahogany moulded beading to edges of panels; complete with 100x25mm thick mahogany architraves at top and middle; secret nailing; priming to surfaces in contact with wall				
E	To plastered surfaces	m2	240		
F	Allow for customization of the timber panelling to employer's requirements; all to architect's details	Item	1		
	<u>ACOUSTIC FOAM PADDING</u>				
	Supply and fix acoustic foam padding to walls comprising of 50mm thick compressed high density foam from Jumbo Chem Kenya Ltd or other equal and approved; fixed on and including 6mm thick high quality plywood nailed on and including 50x50mm thick cypress framework; complete with high quality leather with buttons as cover to compressed hexafoam; complete with and including 75x50mm thick varnished mahogany moulded beadings between foam paddings at horizontal and vertical at 500mm centres; secret nailing; including varnishing frames to approval				
A	To plastered surfaces	m2	637		
	<u>ACOUSTIC PANELS</u>				
B	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	67		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
A	Walls; vertical; internal	m2	6,399		
B	Columns; vertical; internal	m2	1,623		
C	Gypsum partitions	m2	240		
D	Lift shaft and shear walls internally	m2	826		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
E	General surfaces of wood	m2	240		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			8/26		
			8/27		
			8/28		
			8/29		
TOTAL FOR FOURTH FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 8</u>				
	<u>EXTERNAL WALL FINISHES</u>				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	274		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
B	Generally to external walls	m2	1,228		
C	Ditto to beams	m2	431		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D	To plastered external walls	m2	1,228		
E	To plastered beams	m2	431		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	142		
B	<p>To plastered concrete upstands</p>	m2	142		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	Curtain walling generally; diagonal sections; curved to profile	m2	1,200		
	<p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>				
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			8/31		
			8/32		
			8/33		
	TOTAL FOR FOURTH FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	529		
B	Ditto to receive granite tiles	m2	455		
C	Ditto to receive porcelain tiles	m2	551		
D	Ditto to receive carpet	m2	1,464		
F	Ditto to receive engineered wood flooring	m2	283		
F	Ditto to receive acoustic floor panels	m2	187		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Floors; level; internal;	m2	529		
H	18 mm thick x 150mm high skirting; floor; internal	m	543		
I	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Supply and fix polished coloured granite tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
J	Floors; level; internal;	m2	455		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	20 mm thick x 150mm high skirting; floor; internal Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to 18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to	m	198		
B	Floors; level; internal;	m2	551		
C	18 mm thick x 150mm high skirting; floor; internal	m	413		
D	25 x 15 mm solid brass decorative strip to tiled floor Fitted carpet Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval	m	100		
E	To screeded floor Mahogany timber skirting	m2	1,464		
F	150 x 25mm thick moulded timber skirting	m	691		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Engineered wood flooring				
	Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval				
A	To screeded floor	m2	283		
B	150 x 25mm thick moulded mahogany timber skirting	m	207		
	Raised floor panels				
	Supply and fix raised acoustic floor panels size 600x600mm thickness between 50-60mm; to provide functions such as air conditioning and load bearing capacity. With point load of 10000N ; to be flexible, abrasiion resistant, non magnetic and anti-static; complete with pedestal and all jointing materials.				
C	To screeded floor	m2	187		
D	150 x 25mm thick matching skirting	m	69		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
E	Surfaces over 100mm but not exceeding 200mm girth	m	898		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
F	Timber surfaces between 100-200 mm girth	m	898		
G	To general timber surfaces	m2	283		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			8/35		
			8/36		
			8/37		
	TOTAL FOR FOURTH FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	314		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	314		
C	18 mm thick x 150mm high skirting; floor;external	m	393		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	414		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Floors; horizontal; over 300 mm	m2	414		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	210mm diameter rainwater downpipe: fixed to wall using brackets	m	64		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	16		
F	Rainwater shoe	No	16		
G	Rainwater outlets: 210mm diameter	No	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	16		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	16		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			8/39		
			8/40		
			8/41		
	TOTAL FOR FOURTH FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,673		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,121		
C	Moisture resistant gypsum ceiling	m2	130		
C	Cornices 150 x 25 mm polyurethane cornice	m	1,906		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	225		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	74		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	125		
G	Sides of beams; horizontal; Internal	m2	4,232		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	125		
B	Beams; horizontal; Internal	m2	4,232		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	3,234		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	227		
E	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/43		
			8/44		
TOTAL FOR FOURTH FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	52		
B	Sides of beams; horizontal; external	m2	221		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	52		
D	Beams; horizontal; external	m2	221		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/46		
TOTAL FOR FOURTH FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 8					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	93		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	235		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	93		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 5200mm x 600mm wide x 900mm high	No	2		
E	Ditto :average length 4500mm x 600mm wide x 900mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Ditto :average length 1700mm x 600mm wide x 900mm high Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.	No	12		
B	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	24		
C	20 x 100 mm granite fascia Cabinets Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details	m	40		
D	Low level cabinet overall size :overall length 4000mm x 600mm wide x 900mm high at kitchenette Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.	No	1		
E	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	3		
F	20 x 100 mm granite fascia	m	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p>				
A	<p>High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high</p>	No	1		
	<p>Shelving at stores</p>				
B	<p>5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	62		
	<p>Wardrobes</p> <p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
C	<p>Wardrobes overall size 4000 x 600mm wide x 4300mm high</p>	No	12		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sliding glass shower cubicle comprising of 12mm thick toughened glass size 2000 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	12		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 8/48 8/49 8/50 8/51		
	TOTAL FOR FOURTH FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 8				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	<u>ALUMINIUM COMPOSITE CLADDING</u>				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	740		
TOTAL FOR FOURTH FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 8					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 15</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	<p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR FOURTH FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 8</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 8				
	FOURTH FLOOR				
	<u>SECTION SUMMARY- FOURTH FLOOR</u>				
1	FRAME	Page	8/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	8/9		
3	INTERNAL WALLING	Page	8/12		
4	EXTERNAL WALLING	Page	8/13		
5	DOORS AND ASSOCIATED FINISHES	Page	8/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	8/25		
7	INTERNAL WALL FINISHES	Page	8/30		
8	EXTERNAL WALL FINISHES	Page	8/34		
9	INTERNAL FLOOR FINISHES	Page	8/38		
10	EXTERNAL FLOOR FINISHES	Page	8/42		
11	INTERNAL CEILING FINISHES	Page	8/45		
12	EXTERNAL CEILING FINISHES	Page	8/47		
13	FITTINGS	Page	8/52		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	8/53		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	8/54		
	Carried to Final Summary				
	Section No. 8				
	FOURTH FLOOR				

FIFTH FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 9</u>				
	<u>FIFTH FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Intermediate beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	710		
	Up stand beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	51		
	Columns				
D	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
E	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
F	450 mm thick	m3	142		
	Suspended solid floor slab				
G	250 mm thick ; horizontal	m2	3,000		
H	100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,200		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	491		
C	Girth 75mm to 150mm	m	187		
	To vertical or battering sides				
D	Columns or the like; vertical and curved	m2	1,040		
E	Circular curved columns	m2	530		
F	Vertical sides of shear walls; curved to required radii	m2	500		
G	Edges of shear walls ditto	m2	10		
H	Vertical sides of lift shaft walls	m2	632		
I	Edges of lift shaft walls	m	19		
J	Vertical sides and soffits of beams; curved to required radii	m2	4,778		
K	Vertical sides of upstand beams; horizontal;ditto	m2	355		
L	Vertical sides of intermediate beams;ditto	m2	550		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
M	Assorted sizes(T8-T40mm bars)	kg	343,704		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
N	To 100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
EXPANSION JOINTS					
A	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
B	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
C	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail					
D	350 x 350 x 12mm SHS	Kg	47,930		
E	150 x 150 x 6mm SHS	Kg	45,937		
Sundries					
F	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	106		
G	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	192		
H	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	516		
I	16mm dia x 500mm long bolt; complete with nut and washers	No	2,872		
J	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	1,700		
K	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	1,200		
Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish					
L	General surface of steel members	m2	1,545		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/1 9/2 9/3		
	TOTAL FOR FIFTH FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED				
	Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	28		
B	250 mm thick concrete landings	m2	76		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	6,110		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	354		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	113		
	To soffits; horizontal				
G	Landing	m2	76		
	Soffits; sloping				
H	Waists of stairs and the like	m2	104		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	41		
	STAINLESS STEEL BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	354		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	102		
C	To risers; 150 mm high full length slab	m	354		
D	To landing; tiles to approved sizes and pattern	m2	76		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	51		
C	Ditto to edges of landing; 250mm high full length slab	m	113		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	163		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	354		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 20 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	354		
I	Risers; 150 mm high; internal	m	354		
J	Landing	m2	76		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
C	To open edges of landing Girth 225 to 300mm; internal	m	113		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
G	To open edges of landing Girth 225 to 300mm; internal	m	113		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/5 9/6 9/7 9/8		
	TOTAL FOR FIFTH FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laide horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	2,021		
B	150mm thick walls	m2	425		
C	100mm thick walls	m2	216		
	<u>OPERABLE PARTITIONS</u>				
	100mm thick operable partitions; comprising equal panels size 1150x4200mm; including 1st substrate 18ga galvanized steel sheet and 2nd substrate 12mm gypsum board (both sides) with 45kg/m ³ Rockwool infill; with Bottom retractable seal to match MT01 and top retractable seal and 25mm nominal clearance; pivoted on carrier track Type 40 which is fixed on 160x75x8mm fixing plate supported by 10mmØ hanger rods which are bolted to an I- beam anchored to the soffits of the structural concrete beam; finished with Xorel Acoustical Panel Textile Wallcovering Nexus 6425, code 905 (WC 15) and Stainless steel PVD gold ion coated hairline strips (MT05); by HUF COR or equal and approved supplier; as per architectural details				
D	100mm thick partions	m2	40		
	<u>HDF PARTITIONS</u>				
E	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	300		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	350		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	650		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/10		
			9/11		
TOTAL FOR FIFTH FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 9					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ELEMENT NO 4</p> <p>EXTERNAL WALLING</p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	1,228		
<p>TOTAL FOR FIFTH FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 9</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	484		
B	Ditto transomes	m	81		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	274		
D	Ditto transomes	m	16		
	Architraves				
E	75 x 25 mm moulded	m	758		
	Quadrants				
F	25 x 25 mm	m	758		
	Beading; To fanlight				
G	25 x 25 mm	m	240		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	274		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	274		
	WPC Door Quadrants				
J	50 x 25 mm	m	274		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	2		
B	Ditto overall size 1500 mm wide x 2700 mm high	No	2		
C	Ditto overall size 900 mm wide x 2700 mm high	No	46		
D	Sliding door overall size 2000 mm wide x 2700 mm high	No	23		
E	Ditto overall size 1500 mm wide x 2700 mm high	No	24		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	19		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	3		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	43		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	5		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	19		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC DOOR				
	30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.				
A	Double leaf door overall size 1500 mm wide x 2700 mm high	No	2		
	FRAMELESS GLASS DOOR				
	12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details				
B	Sliding door; Overall size 3000 x 2700mm high	No	1		
	12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door with screwed to concrete beam with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval				
C	Double leaf door; Overall size 3000 x 2700mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
C	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	85.5		
D	Ditto 100mmx3.25mm	Pairs	118.5		
E	150mm heavy duty double action spring hinges	Pairs	8		
F	32x600mm high satin stainless steel straight pull handles back to back to approval	No	286		
G	Stainless steel push plate-100x300mm	No	286		
H	Stainless steel pull plate-100x300mm	No	286		
I	19x225mm high S.S conceal fix pull handles	No	286		
J	Stainless steel Abbloy handles on Rose	No	81		
K	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	81		
L	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	19		
M	5-Lever mortice lock complete with aluminium lever handles	No	51		
N	Satin Nickel 70mm Euro restricted Double cylinder	No	51		
O	Oval satin nickel floor mounted door stop fixed with screw to approval	No	175		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	800 x 200mm high stainless steel kick plate onto both sides to approval	No	162		
B	Satin steel Euro profile escutcheons	No	51		
C	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	90		
D	Coat and hat hook with rubber tip in stainless steel finish	No	30		
E	Indicator lock 'Vacant / Engaged'	No	28		
F	Indicator lock 'Vacant / Engaged'-disabled	No	2		
G	200x300mm high stainless steel transfer grills	No	162		
H	Door viewer	No	12		
I	Door guard wish bone tye satin finish	No	12		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	758		
D	Door frame; girth 100 mm to 200 mm	m	274		
E	Architraves girth not exceeding 100 mm	m	1,032		
F	Quadrants/Beading girth not exceeding 100 mm	m	1,032		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	1,129		
H	Architraves girth 100 mm to 200mm	m	1,306		
I	Quadrants/beading girth not exceeding 100 mm	m	998		
J	General surfaces of wood	m2	638		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	28		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT		
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE						
	Total Brought Forward from Page No.		Page No. 9/14 9/15 9/16 9/17 9/18 9/19 9/20 9/21				
	TOTAL FOR FIFTH FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				<table border="1"> <tr> <td></td> </tr> <tr> <td></td> </tr> </table>		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	18		
B	Window overall size 1500 x 1500 mm high-sliding	No	12		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
C	250 x 25mm Window board	m	66		
D	20 x 25mm Quadrant beading	m	66		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	66		
B	Ditto: 0-100 mm girth	m	66		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	66		
D	Ditto: 0-100 mm girth	m	66		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	567		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	48		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/23		
			9/24		
	TOTAL FOR FIFTH FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	4,480		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,208		
E	Ditto to receive timber wall panelling	m2	521		
F	Ditto to receive acoustic foam padding	m2	448		
G	Ditto to receive acoustic panels	m2	50		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Walls; vertical; internal	m2	1,661		
I	Extra over for 100 mm wide decorative tile to approval	m	353		
J	Aluminium edging strip to corners of granito tiled walls	m	309		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	117		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TIMBER PANELLING				
	25mm thick solid mahogany panels with grooves; fixed to masonry/concrete surfaces on and including 50x25mm softwood timber framework; 150x50mm thick mahogany moulded beading to edges of panels; complete with 100x25mm thick mahogany architraves at top and middle; secret nailing; priming to surfaces in contact with wall				
E	To plastered surfaces	m2	521		
F	Allow for customization of the timber panelling to employer's requirements; all to architect's details	Item	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC FOAM PADDING				
	Supply and fix acoustic foam padding to walls comprising of 50mm thick compressed high density foam from Jumbo Chem Kenya Ltd or other equal and approved; fixed on and including 6mm thick high quality plywood nailed on and including 50x50mm thick cypress framework; complete with high quality leather with buttons as cover to compressed hexafoam; complete with and including 75x50mm thick varnished mahogany moulded beadings between foam paddings at horizontal and vertical at 500mm centres; secret nailing; including varnishing frames to approval				
A	To plastered surfaces	m2	448		
	ACOUSTIC PANELS				
	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	50		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
C	Walls; vertical; internal	m2	4,480		
D	Columns; vertical; internal	m2	1,623		
E	Gypsum partitions	m2	400		
F	Lift shaft and shear walls internally	m2	826		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	General surfaces of wood	m2	521		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			9/26		
			9/27		
			9/28		
TOTAL FOR FIFTH FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	274		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
B	Generally to external walls	m2	1,228		
C	Ditto to beams	m2	431		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D	To plastered external walls	m2	1,228		
E	To plastered beams	m2	431		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p>	m2	142		
B	<p>20 mm thick; butt joints straight both ways</p> <p>To plastered concrete upstands</p>	m2	142		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	CURTAIN WALLING				
	Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs				
A	Curtain walling generally; diagonal sections; curved to profile	m2	1,200		
	Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.				
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/30		
			9/31		
			9/32		
	TOTAL FOR FIFTH FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 9				
	INTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	441		
B	Ditto to receive granite tiles	m2	580		
C	Ditto to receive porcelain tiles	m2	1,049		
D	Ditto to receive carpet	m2	1,243		
E	Ditto to receive engineered wood flooring	m2	475		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
F	Floors; level; internal;	m2	441		
G	18 mm thick x 150mm high skirting; floor; internal	m	473		
H	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
I	Floors; level; internal;	m2	580		
J	20 mm thick x 150mm high skirting; floor; internal	m	234		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
A	Floors; level; internal;	m2	1,049		
B	18 mm thick x 150mm high skirting; floor; internal	m	688		
C	25 x 15 mm solid brass decorative strip to tiled floor	m	100		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
D	To screeded floor	m2	1,243		
	<p>Mahogany timber skirting</p>				
E	150 x 25mm thick moulded timber skirting	m	740		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Engineered wood flooring				
	Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval				
A	To screeded floor	m2	475		
B	150 x 25mm thick moulded mahogany timber skirting	m	239		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Surfaces over 100mm but not exceeding 200mm girth	m	979		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
D	Timber surfaces between 100-200 mm girth	m	979		
E	To general timber surfaces	m2	475		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			9/34		
			9/35		
			9/36		
	TOTAL FOR FIFTH FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	314		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	314		
C	18 mm thick x 150mm high skirting; floor;external	m	393		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	373		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Floors; horizontal; over 300 mm	m2	373		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	210mm diameter rainwater downpipe: fixed to wall using brackets	m	64		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	16		
F	Rainwater shoe	No	16		
G	Rainwater outlets: 210mm diameter	No	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	16		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	16		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			9/38		
			9/39		
			9/40		
TOTAL FOR FIFTH FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,684		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,053		
C	Moisture resistant gypsum ceiling	m2	139		
C	Cornices 150 x 25 mm polyurethane cornice	m	1,955		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	579		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	277		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	98		
G	Sides of beams; horizontal; Internal	m2	4,232		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	98		
B	Beams; horizontal; Internal	m2	4,232		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	3,211		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	188		
E	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/42		
			9/43		
TOTAL FOR FIFTH FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	52		
B	Sides of beams; horizontal; external	m2	216		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	52		
D	Beams; horizontal; external	m2	216		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/45		
TOTAL FOR FIFTH FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 9					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	92		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	234		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	92		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 5200mm x 600mm wide x 900mm high	No	2		
E	Ditto :average length 2000mm x 600mm wide x 900mm high	No	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Ditto :average length 1700mm x 600mm wide x 900mm high Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.	No	12		
B	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	26		
C	20 x 100 mm granite fascia Cabinets Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details	m	43		
D	Low level cabinet overall size :overall length 6000mm x 600mm wide x 900mm high at kitchenette	No	2		
E	Ditto overall size :overall length 5000mm x 600mm wide x 900mm high at lactation Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.	No	2		
F	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	14		
G	20 x 100 mm granite fascia Carried to Collection	m	22		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p>				
A	<p>High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high</p>	No	4		
	<p>Shelving at stores</p>				
B	<p>5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	55		
	<p>Wardrobes</p>				
	<p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
C	<p>Wardrobes overall size 4000 x 600mm wide x 4300mm high</p>	No	12		
D	<p>Ditto overall size 2500 x 600mm wide x 4300mm high</p>	No	6		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sliding glass shower cubicle comprising of 12mm thick toughened glass size 2000 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	18		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 9/47 9/48 9/49 9/50		
TOTAL FOR FIFTH FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 9					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	<u>ALUMINIUM COMPOSITE CLADDING</u>				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
J	Butt joints; over 300mm wide	m2	740		
	TOTAL FOR FIFTH FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 9				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 15</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR FIFTH FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 9</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 9				
	FIFTH FLOOR				
	<u>SECTION SUMMARY- FIFTH FLOOR</u>				
1	FRAME	Page	9/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	9/9		
3	INTERNAL WALLING	Page	9/12		
4	EXTERNAL WALLING	Page	9/13		
5	DOORS AND ASSOCIATED FINISHES	Page	9/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	9/25		
7	INTERNAL WALL FINISHES	Page	9/29		
8	EXTERNAL WALL FINISHES	Page	9/33		
9	INTERNAL FLOOR FINISHES	Page	9/37		
10	EXTERNAL FLOOR FINISHES	Page	9/41		
11	INTERNAL CEILING FINISHES	Page	9/44		
12	EXTERNAL CEILING FINISHES	Page	9/46		
13	FITTINGS	Page	9/51		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	9/52		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	9/53		
	Carried to Final Summary				
	Section No. 9				
	FIFTH FLOOR				

SIXTH FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 10</u>				
	<u>SIXTH FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Intermediate beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	710		
	Up stand beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	51		
	Columns				
D	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
E	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
F	450 mm thick	m3	142		
	Suspended solid floor slab				
G	250 mm thick ; horizontal	m2	3,000		
H	100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,200		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	491		
C	Girth 75mm to 150mm	m	187		
	To vertical or battering sides				
D	Columns or the like; vertical and curved	m2	1,040		
E	Circular curved columns	m2	530		
F	Vertical sides of shear walls; curved to required radii	m2	500		
G	Edges of shear walls ditto	m2	10		
H	Vertical sides of lift shaft walls	m2	632		
I	Edges of lift shaft walls	m	19		
J	Vertical sides and soffits of beams; curved to required radii	m2	4,778		
K	Vertical sides of upstand beams; horizontal;ditto	m2	355		
L	Vertical sides of intermediate beams;ditto	m2	550		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
M	Assorted sizes(T8-T40mm bars)	kg	343,704		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
N	To 100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXPANSION JOINTS				
A	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
B	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
C	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
D	350 x 350 x 12mm SHS	Kg	47,930		
E	150 x 150 x 6mm SHS	Kg	45,937		
	Sundries				
F	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	106		
G	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	192		
H	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	516		
I	16mm dia x 500mm long bolt; complete with nut and washers	No	2,872		
J	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	1,700		
K	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	1,200		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
L	General surface of steel members	m2	1,545		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/1 10/2 10/3		
	TOTAL FOR SIXTH FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED				
	Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	28		
B	250 mm thick concrete landings	m2	76		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	6,110		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	354		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	113		
	To soffits; horizontal				
G	Landing	m2	76		
	Soffits; sloping				
H	Waists of stairs and the like	m2	104		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>METAL WORK</p> <p>BALUSTRADES</p> <p>ROLLED PLATES, BARS, SECTIONS AND TUBES</p> <p>GLASS BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval</p>				
A	1150 mm high to detail	m	41		
	<p>STAINLESS STEEL BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval</p>				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	354		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	102		
C	To risers; 150 mm high full length slab	m	354		
D	To landing; tiles to approved sizes and pattern	m2	76		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	51		
C	Ditto to edges of landing; 250mm high full length slab	m	113		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	163		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	354		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 20 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	354		
I	Risers; 150 mm high; internal	m	354		
J	Landing	m2	76		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
C	To open edges of landing Girth 225 to 300mm; internal	m	113		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
G	To open edges of landing Girth 225 to 300mm; internal	m	113		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/5 10/6 10/7 10/8		
	TOTAL FOR SIXTH FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	1,963		
B	150mm thick walls	m2	314		
C	100mm thick walls	m2	187		
	<u>HDF PARTITIONS</u>				
D	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	250		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	200		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	450		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	180		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/10		
			10/11		
	TOTAL FOR SIXTH FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ELEMENT NO 4</p> <p>EXTERNAL WALLING</p> <p>BLOCKWORK</p> <p>Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar</p> <p>200 mm thick walls</p>	m2	1,228		
<p>TOTAL FOR SIXTH FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 10</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	409		
B	Ditto transomes	m	61		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	361		
D	Ditto transomes	m	27		
	Architraves				
E	75 x 25 mm moulded	m	770		
	Quadrants				
F	25 x 25 mm	m	770		
	Beading; To fanlight				
G	25 x 25 mm	m	231		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	361		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	361		
	WPC Door Quadrants				
J	50 x 25 mm	m	361		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	8		
B	Ditto overall size 1500 mm wide x 2700 mm high	No	3		
C	Ditto overall size 900 mm wide x 2700 mm high	No	5		
D	Sliding door overall size 2000 mm wide x 2700 mm high	No	12		
E	Ditto overall size 1500 mm wide x 2700 mm high	No	11		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	33		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	4		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	52		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	6		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	33		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ACOUSTIC DOOR				
	30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.				
A	Double leaf door overall size 1500 mm wide x 2700 mm high	No	1		
	FRAMELESS GLASS DOOR				
	12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details				
B	Sliding door; Overall size 3000 x 2700mm high	No	1		
	12mm thick toughened frameless glass door with polycarbonate security film on both sides; double leaf door screwed to concrete columns/masonry wall with appropriate screws; including patch fittings, stainless steel hinges, stainless steel pull handles/push and pull plates, automatic door closer ,tower bolt,door locks and any other necessary ironmongery all as "Assa Abloy" or other equal and approved ; to Architect's details and approval				
C	Double leaf door; Overall size 7200 x 2400mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
C	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	99.0		
D	Ditto 100mmx3.25mm	Pairs	139.5		
E	150mm heavy duty double action spring hinges	Pairs	9		
F	32x600mm high satin stainless steel straight pull handles back to back to approval	No	262		
G	Stainless steel push plate-100x300mm	No	262		
H	Stainless steel pull plate-100x300mm	No	262		
I	19x225mm high S.S conceal fix pull handles	No	262		
J	Stainless steel Abbloy handles on Rose	No	92		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	92		
B	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	33		
C	5-Lever mortice lock complete with aluminium lever handles	No	62		
D	Satin Nickel 70mm Euro restricted Double cylinder	No	62		
E	Oval satin nickel floor mounted door stop fixed with screw to approval	No	171		
F	800 x 200mm high stainless steel kick plate onto both sides to approval	No	210		
G	Satin steel Euro profile escutcheons	No	62		
H	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	124		
I	Coat and hat hook with rubber tip in stainless steel finish	No	34		
J	Indicator lock 'Vacant / Engaged'	No	32		
K	Indicator lock 'Vacant / Engaged'-disabled	No	2		
L	200x300mm high stainless steel transfer grills	No	210		
M	Door viewer	No	12		
N	Door guard wish bone tye satin finish	No	12		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	770		
D	Door frame; girth 100 mm to 200 mm	m	361		
E	Architraves girth not exceeding 100 mm	m	1,131		
F	Quadrants/Beading girth not exceeding 100 mm	m	1,131		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	1,219		
H	Architraves girth 100 mm to 200mm	m	1,492		
I	Quadrants/beading girth not exceeding 100 mm	m	1,001		
J	General surfaces of wood	m2	601		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	26		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/14 10/15 10/16 10/17 10/18 10/19 10/20 10/21		
	TOTAL FOR SIXTH FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	10		
B	Window overall size 1500 x 1500 mm high-sliding	No	12		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
C	250 x 25mm Window board	m	47		
D	20 x 25mm Quadrant beading	m	47		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	47		
B	Ditto: 0-100 mm girth	m	47		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	47		
D	Ditto: 0-100 mm girth	m	47		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass I section rails and all other necessary accessories	m2	450		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	42		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/23 10/24		
	TOTAL FOR SIXTH FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	5,067		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,834		
E	Ditto to receive acoustic panels	m2	100		
F	Ditto to receive polyurethane coating	m2	140		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Walls; vertical; internal	m2	2,261		
H	Extra over for 100 mm wide decorative tile to approval	m	478		
I	Aluminium edging strip to corners of granito tiled walls	m	262		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	98		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	To waterfeature	m2	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Works to be executed by an approved specialist				
	Supply and apply high quality polyurethane coating including preparing surface, fill control joints with shrinkage compensated mortar; apply moisture barrier and Captive blasting and wash with approved acid; apply primer and two coats of polyurethane coating ; applied in accordance with manufacturer's printed instructions				
A	To plastered walls	m2	140		
	<u>ACOUSTIC PANELS</u>				
B	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	100		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
C	Walls; vertical; internal	m2	5,067		
D	Columns; vertical; internal	m2	1,623		
E	Gypsum partitions	m2	360		
F	Lift shaft and shear walls internally	m2	826		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/26 10/27 10/28		
TOTAL FOR SIXTH FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10					<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	274		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
B	Generally to external walls	m2	1,228		
C	Ditto to beams	m2	431		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D	To plastered external walls	m2	1,228		
E	To plastered beams	m2	431		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p>	m2	142		
B	<p>20 mm thick; butt joints straight both ways</p> <p>To plastered concrete upstands</p>	m2	142		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	Curtain walling generally; diagonal sections; curved to profile	m2	1,200		
	<p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>				
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/30 10/31 10/32		
	TOTAL FOR SIXTH FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 9				
	INTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	903		
B	Ditto to receive granite tiles	m2	546		
C	Ditto to receive porcelain tiles	m2	415		
E	Ditto to receive carpet	m2	289		
D	Ditto to receive timber floor boards	m2	73		
E	Ditto to receive epoxy flooring	m2	77		
F	Ditto to receive engineered wood flooring	m2	437		
G	Ditto to receive gym flooring	m2	755		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Floors; level; internal;	m2	903		
I	18 mm thick x 150mm high skirting; floor; internal	m	743		
J	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to</p>				
A	Floors; level; internal;	m2	546		
B	20 mm thick x 150mm high skirting; floor; internal	m	238		
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
C	Floors; level; internal;	m2	415		
D	18 mm thick x 150mm high skirting; floor; internal	m	339		
E	25 x 15 mm solid brass decorative strip to tiled floor	m	100		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
F	To screeded floor	m2	289		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Mahogany timber skirting				
A	150 x 25mm thick moulded timber skirting	m	241		
	Solid beech flooring				
	Wrot solid beech wood strip floor toungued and grooved boarding : laid on and including 50 x 25mm thick cyress battens at 600mm centres both ways : butt jointed : secret nailing				
B	25mm thick timber floor boarding at squash	m2	66		
	Works to be executed by an approved specialist				
	Supply and apply anti-static solvent free high build epoxy floor including grinding surface to remove surface laitance and expose defects, repairing defects and cracks, fill control joints with shrinkage compensated mortar; apply moisture barrier and Captive blasting and wash with approved acid; apply epoxy primer with and including 0.5mm quartz sand , epoxy undercoat and one top coat of epoxy ; applied in accordance with manufacturer’s printed instructions				
	3 mm thick, 2 No coat work to concrete base (m.s);				
C	To screeded floor	m2	77		
	Engineered wood flooring				
	Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval				
D	To screeded floor	m2	437		
E	150 x 25mm thick moulded mahogany timber skirting	m	262		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Gym flooring				
	Supply and install gym rubber flooring complete with and including underlay; all to architect's specifications and approval				
A	To screeded floor	m2	755		
B	150 x 25mm thick moulded mahogany timber skirting	m	147		
	PAINTING AND DECORATION				
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Surfaces over 100mm but not exceeding 200mm girth	m	650		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
D	Timber surfaces between 100-200 mm girth	m	650		
E	To general timber surfaces	m2	437		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/34 10/35 10/36 10/37		
	TOTAL FOR SIXTH FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	314		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	314		
C	18 mm thick x 150mm high skirting; floor;external	m	393		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	414		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Floors; horizontal; over 300 mm	m2	414		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	210mm diameter rainwater downpipe: fixed to wall using brackets	m	64		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	16		
F	Rainwater shoe	No	16		
G	Rainwater outlets: 210mm diameter	No	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	16		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	16		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/39 10/40 10/41		
TOTAL FOR SIXTH FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10					<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,485		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,134		
C	Moisture resistant gypsum ceiling	m2	148		
D	Cornices 150 x 25 mm polyurethane cornice	m	1,347		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
E	Horizontal ceiling ; internal	m2	83		
F	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	53		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
G	Ceiling and soffits of beams; horizontal; internal	m2	146		
H	Sides of beams; horizontal; Internal	m2	4,232		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Cypress boards ceilings				
	Prime grade cypress strip toungued and grooved ceiling boarding : laid on and including 50 x 25mm thick cypress battens at 600mm centres both ways nailed to concrete ceiling : butt jointed : priming to surfaces in contact with wall; secret nailing				
A	25mm thick timber board ceiling	m2	70		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
B	Ceilings ; girth over 300 mm ; internal	m2	146		
C	Beams; horizontal; Internal	m2	4,232		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
D	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	3,052		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
E	To general timber surfaces	m2	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ALUMINIUM COMPOSITE CEILING				
	<p>Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes; comprising of normal PE core, aluminium panel, primer, paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details</p>				
A	Butt joints; over 300mm wide	m2	485		
B	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/43 10/44 10/45		
TOTAL FOR SIXTH FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	52		
B	Sides of beams; horizontal; external	m2	216		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	52		
D	Beams; horizontal; external	m2	216		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/47		
TOTAL FOR SIXTH FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 10					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	144		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	332		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	144		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 5200mm x 600mm wide x 900mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Ditto :average length 3600mm x 600mm wide x 900mm high	No	2		
B	Ditto :average length 2500mm x 600mm wide x 900mm high	No	2		
C	Ditto :average length 1700mm x 600mm wide x 900mm high Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.	No	12		
D	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	27		
E	20 x 100 mm granite fascia Cabinets Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details	m	45		
F	Low level cabinet overall size :overall length 6000mm x 600mm wide x 900mm high at kitchenette	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.				
A	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	10		
B	20 x 100 mm granite fascia	m	16		
	High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery				
C	High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high	No	2		
	Shelving at stores				
D	5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets	m	69		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Wardrobes</p> <p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
A	Wardrobes overall size 4000 x 600mm wide x 4300mm high	No	12		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sliding glass shower cubicle comprising of 12mm thick toughened glass size 2000 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	12		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/49 10/50 10/51 10/52 10/53		
	TOTAL FOR SIXTH FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	<u>STEEL STRUCTURE AND ASSOCIATED FINISHES</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	<u>ALUMINIUM COMPOSITE CLADDING</u>				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	740		
	TOTAL FOR SIXTH FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 14</u>				
	GYM EQUIPMENT				
	Supply, deliver, install, test and commission the following new gym equipment complete with all the accessories including all connections, supports and all plugging and screwing to floor/walls.				
	Cardio Area				
A	TreadMill as Lifefitness Elevation series or approved equivalent.	No	2		
B	Crosstrainer as Lifefitness Elevation series or approved equivalent.	No	1		
C	Recumbent Bike as Lifefitness Elevation series or approved equivalent.	No	2		
D	Upright Bike as Lifefitness Elevation series or approved equivalent.	No	1		
E	Staircase master machine as Lifefitness Elevation series or approved equivalent.	No	1		
F	Rowing machine as Lifefitness Elevation series or approved equivalent.	No	1		
G	Lat pull-down machine as Lifefitness Elevation series or approved equivalent.	No	2		
I	5-Stack Multi-station Lifefitness Gym Equipment or approved equivalent.	No	1		
	Free Weight Area				
J	Decline / adjustable bench as Lifefitness Gym Equipment or approved equivalent.	No	2		
K	Multi-adjustable bench as Lifefitness Gym Equipment or approved equivalent.	No	2		
L	Flat bench as Lifefitness Gym Equipment or approved equivalent.	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Twin tier barbell rack as Lifefitness Gym Equipment or approved equivalent.	No	4		
B	2-24Kgs(10 Pairs) rubber Dumbells as Lifefitness Gym Equipment or approved equivalent.	No	5		
C	1.25kg-25kg rubber coated discs as Lifefitness Gym Equipment or approved equivalent.	No	5		
D	Floor mat as Lifefitness Elevation series or approved equivalent.	No	2		
Strength Area					
E	Multi Press as Lifefitness Gym Equipment or approved equivalent.	No	1		
F	Dual adjustable Pulley as Lifefitness Gym Equipment or approved equivalent.	No	1		
G	Aerobic Steps as Lifefitness Gym Equipment or approved equivalent.	No	20		
H	6mm thick mirrors of size 2400 x 1200mm	No	20		
I	Allow for Gym equipment synchronization and data connections	Item	1		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	GYM EQUIPMENT COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 10/56 10/57		
	TOTAL FOR SIXTH FLOOR -GYM EQUIPMENT CARRIED FORWARD TO SUMMARY OF SECTION NO. 10				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 16</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical, concealed fixings, building management system, audio visual, structured cabling, security, public address, solar water heating, boiler installations, gym installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR SIXTH FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 10</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 10				
	SIXTH FLOOR				
	<u>SECTION SUMMARY- SIXTH FLOOR</u>				
1	FRAME	Page	10/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	10/9		
3	INTERNAL WALLING	Page	10/12		
4	EXTERNAL WALLING	Page	10/13		
5	DOORS AND ASSOCIATED FINISHES	Page	10/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	10/25		
7	INTERNAL WALL FINISHES	Page	10/29		
8	EXTERNAL WALL FINISHES	Page	10/33		
9	INTERNAL FLOOR FINISHES	Page	10/38		
10	EXTERNAL FLOOR FINISHES	Page	10/42		
11	INTERNAL CEILING FINISHES	Page	10/46		
12	EXTERNAL CEILING FINISHES	Page	10/48		
13	FITTINGS	Page	10/54		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	10/55		
15	GYM EQUIPMENT	Page	10/58		
16	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	10/59		
	Carried to Final Summary				
	Section No. 10				
	SIXTH FLOOR				

SEVENTH FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 11</u>				
	<u>SEVENTH FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Intermediate beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	50		
	Gutter beams				
B	Gutter Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	125		
	Beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	886		
	Up stand beams				
D	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	51		
	Columns				
E	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	305		
	Shear walls				
F	450 mm thick shear walls ditto	m3	113		
	Lift shaft walls				
G	450 mm thick	m3	142		
	Suspended solid floor slab				
H	250 mm thick ; horizontal	m2	3,000		
I	100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	4,200		
	To edges of suspended floor slab				
B	Girth 225 mm to 300 mm	m	491		
C	Girth 75mm to 150mm	m	187		
	To vertical or battering sides				
D	Columns or the like; vertical and curved	m2	1,040		
E	Circular curved columns	m2	530		
F	Vertical sides of shear walls; curved to required radii	m2	500		
G	Edges of shear walls ditto	m2	10		
H	Vertical sides of lift shaft walls	m2	632		
I	Edges of lift shaft walls	m	19		
J	Vertical sides and soffits of beams; curved to required radii	m2	4,778		
K	Vertical sides of upstand beams; horizontal;ditto	m2	355		
L	Vertical sides of intermediate beams;ditto	m2	550		
M	Stepped sides of moulded gutter beams;2 no steps 1no chamfer; overall 1950mm girth	m2	615		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
N	Assorted sizes(T8-T40mm bars)	kg	387,554		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
O	To 100mm thick solid slab	m2	1,200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXPANSION JOINTS				
A	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	260		
B	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	74		
C	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	260		
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
D	350 x 350 x 12mm SHS	Kg	47,930		
E	150 x 150 x 6mm SHS	Kg	45,937		
	Sundries				
F	1050 x 500 x 12mm thick M.S plates; with 8no. holes	No	106		
G	500 x 500 x 12mm thick M.S plates; with 4no. holes	No	192		
H	500 x 500 x 6mm thick M.S plates; with 4no. holes	No	516		
I	16mm dia x 500mm long bolt; complete with nut and washers	No	2,872		
J	22 gauge wire gauze welded to girder beams(m/s) and deck (m/s)	m2	1,700		
K	Supply and fix 21 gauge structural decking sheet as 'Safdeck' from MRM Ltd or other equal and approved; complete with 32mm fasteners, 12mm dia shear studs at 600mm c/c and any other accessories; to manufacturer's written instruction	m2	1,200		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
L	General surface of steel members	m2	1,545		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/1 11/2 11/3		
	TOTAL FOR SEVENTH FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>STAIRCASES AND STAIRCASE FINISHES</u>				
	INSITU CONCRETE : REINFORCED				
	Normal; class 35/20mm; Vibrated				
A	Steps, staircases or strings	m3	28		
B	250 mm thick concrete landings	m2	76		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	6,110		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	354		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Vertical edge : suspended landing :				
F	Over 225mm but not exceeding 300mm high	m	113		
	To soffits; horizontal				
G	Landing	m2	76		
	Soffits; sloping				
H	Waists of stairs and the like	m2	104		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>METAL WORK</p> <p>BALUSTRADES</p> <p>ROLLED PLATES, BARS, SECTIONS AND TUBES</p> <p>GLASS BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 50mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval</p>				
A	1150 mm high to detail	m	41		
	<p>STAINLESS STEEL BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) comprising of 50mm diameter x 3mm thick stainless steel tube handrail welded to 50mm diameter x 3mm thick stainless steel balusters at fixed to concrete floor at 1000mm centres; balusters fixed to and including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete; complete with 4no. 25mm diameter x 3mm thick horizontal middle rails ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval</p>				
B	1150 mm high to detail	m	10		
C	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide full length slab with bull nosings (rounded and double granite edges)	m	354		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	102		
C	To risers; 150 mm high full length slab	m	354		
D	To landing; tiles to approved sizes and pattern	m2	76		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	51		
C	Ditto to edges of landing; 250mm high full length slab	m	113		
F	25 mm thick x 150 mm high matching skirting to stairs; internal	m	163		
G	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 20mm thick granite slab finish (m/s)	m	354		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 20 mm thick one coat beds; wood floated to receive granite tiles (m/s) to concrete or block work base; generally to				
H	Treads; 300 mm wide; internal	m	354		
I	Risers; 150 mm high; internal	m	354		
J	Landing	m2	76		
K	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
C	To open edges of landing Girth 225 to 300mm; internal	m	113		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
E	Soffits of stairs; sloping Over 300mm girth; internal	m2	104		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	76		
G	To open edges of landing Girth 225 to 300mm; internal	m	113		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/5 11/6 11/7 11/8		
	TOTAL FOR SEVENTH FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laide horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	2,718		
B	150mm thick walls	m2	511		
C	100mm thick walls	m2	490		
	<u>OPERABLE PARTITIONS</u>				
	100mm thick operable partitions; comprising equal panels size 1150x4200mm; including 1st substrate 18ga galvanized steel sheet and 2nd substrate 12mm gypsum board (both sides) with 45kg/m ³ Rockwool infill; with Bottom retractable seal to match MT01 and top retractable seal and 25mm nominal clearance; pivoted on carrier track Type 40 which is fixed on 160x75x8mm fixing plate supported by 10mmØ hanger rods which are bolted to an I- beam anchored to the soffits of the structural concrete beam; finished with Xorel Acoustical Panel Textile Wallcovering Nexus 6425, code 905 (WC 15) and Stainless steel PVD gold ion coated hairline strips (MT05); by HUF COR or equal and approved supplier; as per architectural details				
D	100mm thick partions	m2	117		
	<u>HDF PARTITIONS</u>				
E	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL PARTITIONING				
	ALUMINIUM FRAMED PARTITIONING				
A	Supply, assemble and fix 4300 mm high purpose made matt powder coated finish aluminium partitions comprising 3 mm thick (minimum) approved aluminium sections comprising of 100 x 50 mm top & bottom rails and 100 x 50 mm vertical members at 900 mm centres; horizontally divided into three parts consisting of 1850mm high bottom panel infilled with 20mm thick beech laminated MDF board, 1850mm high middle panel infilled with 8mm laminated glazing; 600mm high top panel with openable 8mm thick clear glass louvers size 600 x 150 x 6mm thick; including all accessories such as beadings and sub frames, 150 mm wide flashing to seal, rubber gaskets and the like: all necessary ironmongery	m2	300		
	FRAMELESS GLASS PARTITION				
B	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	370		
	GLASS FILMS				
C	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	670		
	GYPSUM BOARD PARTITIONS				
	Drywall partition comprising of : 2No 12mm thick ordinary gypsum board on each side; built on 4300mm(average) high 75 x 50mm thick galvanised steel studs well spaced at 600mm centres; 75 x 50mm bottom track built into concrete upstand(m/s) and 75 x 50mm top track built into soffits of concrete slab ; all joints and internal corners taped with rhino tape; with and including rockwool soundproofing infill; including priming and applying two layers of skim plaster ; to-				
D	100mm thick walls	m2	448		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/10		
			11/11		
TOTAL FOR SEVENTH FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 11					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p><u>ELEMENT NO 4</u></p> <p><u>EXTERNAL WALLING</u></p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	1,228		
<p>TOTAL FOR SEVENTH FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 11</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	423		
B	Ditto transomes	m	64		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	231		
D	Ditto transomes	m	12		
	Architraves				
E	75 x 25 mm moulded	m	654		
	Quadrants				
F	25 x 25 mm	m	654		
	Beading; To fanlight				
G	25 x 25 mm	m	192		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	231		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	231		
	WPC Door Quadrants				
J	50 x 25 mm	m	231		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ALUMINIUM DOORS				
	Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.				
A	Double leaf door; overall size 2000 mm wide x 2700 mm high	No	10		
B	Ditto overall size 1500 mm wide x 2700 mm high	No	3		
C	Ditto overall size 900 mm wide x 2700 mm high	No	12		
D	Sliding door overall size 2000 mm wide x 2700 mm high	No	13		
E	Ditto overall size 1500 mm wide x 2700 mm high	No	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	1		
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
B	Single leaf door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	12		
C	Ditto overall size 800 mm wide x 2400 mm high openable door	No	30		
D	Single leaf double Swing overall size 1200 mm wide x 2400 mm high openable door (pwd)	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Double leaf door hardwood panel door overall size 1600 x 2700mm high complete with 1600 x 300mm high glazed fanlight	No	5		
B	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	52		
C	Single leaf door double swing overall size 1200 x 2700mm high	No	7		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
D	Single leaf door overall size 900 x 2700mm high	No	12		
	FIRE DOOR				
	Supply and fix the following doors selected from "Assa Abloy" catalogue or other equal and approved 120 minutes Fire door as " ASTURMADI" or other equal and approved; with fireproof frames, vision panel and hardware; frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architect's approval.				
E	Double leaf door overall size 1500 mm wide x 2700 mm high with 2no. view glass panel overall size 200 mm wide x 600 mm high in 8 mm thick clear polished georgian wired glazing	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ACOUSTIC DOOR</p> <p>30 decibels rated acoustic door as " ASTURMADI" with fireproof frames, frames and leaf made of 1.5mm thick G.I Steel in filled with rockwool and gypsum powder ;galvanised steel stiffeners and finished in polyester powder coating; including fixing all necessary fireproof ironmongery; all in accordance to manufacturers printed instructions and Architects approval.</p> <p>Double leaf door overall size 1500 mm wide x 2700 mm high</p>	No	1		
B	<p>FRAMELESS GLASS DOOR</p> <p>12mm thick toughened frameless glass automatic sliding with polycarbonate security film on both sides; complete with and including programming switch, battery back up, motion detectors, sensors,adaptors,patch fittings, bottom and top sliding rails, including accessories, opening mechanism and all necessary ironmongery all as " Assa Abloy" or other equal and approved; to architect's details</p> <p>Sliding door; Overall size 3000 x 2700mm high</p>	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	30		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
C	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	102.0		
D	Dltto 100mmx3.25mm	Pairs	108.0		
E	150mm heavy duty double action spring hinges	Pairs	11		
F	32x600mm high satin stainless steel straight pull handles back to back to approval	No	238		
G	Stainless steel push plate-100x300mm	No	238		
H	Stainless steel pull plate-100x300mm	No	238		
I	19x225mm high S.S conceal fix pull handles	No	238		
J	Stainless steel Abbloy handles on Rose	No	94		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	94		
B	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	12		
C	5-Lever mortice lock complete with aluminium lever handles	No	64		
D	Satin Nickel 70mm Euro restricted Double cylinder	No	64		
E	Oval satin nickel floor mounted door stop fixed with screw to approval	No	163		
F	800 x 200mm high stainless steel kick plate onto both sides to approval	No	174		
G	Satin steel Euro profile escutcheons	No	64		
H	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	108		
I	Coat and hat hook with rubber tip in stainless steel finish	No	25		
J	Indicator lock 'Vacant / Engaged'	No	23		
K	Indicator lock 'Vacant / Engaged'-disabled	No	2		
L	200x300mm high stainless steel transfer grills	No	174		
M	Door viewer	No	12		
N	Door guard wish bone tye satin finish	No	12		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	5		
B	Over 300 mm ; externally	m2	5		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
C	Door frame; girth 200 mm to 300 mm	m	654		
D	Door frame; girth 100 mm to 200 mm	m	231		
E	Architraves girth not exceeding 100 mm	m	885		
F	Quadrants/Beading girth not exceeding 100 mm	m	885		
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
G	Door frame; girth 200 mm to 300 mm	m	961		
H	Architraves girth 100 mm to 200mm	m	1,116		
I	Quadrants/beading girth not exceeding 100 mm	m	846		
J	General surfaces of wood	m2	526		
	GLAZING				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
K	In panes not exceeding 0.50 square meters	m2	22		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/14 11/15 11/16 11/17 11/18 11/19 11/20 11/21		
	TOTAL FOR SEVENTH FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2000 x 2000 mm high	No	5		
B	Window overall size 1500 x 1500 mm high-sliding	No	8		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
C	250 x 25mm Window board	m	30		
D	20 x 25mm Quadrant beading	m	30		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	30		
B	Ditto: 0-100 mm girth	m	30		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	30		
D	Ditto: 0-100 mm girth	m	30		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	415		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/23 11/24		
	TOTAL FOR SEVENTH FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	7,827		
B	Ditto columns; vertical; internally	m2	1,623		
C	Lift shaft and shear walls internally	m2	826		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to walls generally (m/s) ; internally				
D	Walls; vertical; internal to receive wall tiles	m2	2,107		
E	Ditto to receive acoustic foam padding	m2	176		
F	Ditto to receive acoustic panels	m2	50		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
G	Walls; vertical; internal	m2	1,513		
H	Extra over for 100 mm wide decorative tile to approval	m	320		
I	Aluminium edging strip to corners of granito tiled walls	m	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Lift walls; vertical;	m2	330		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	100		
C	Upstand masonry walls; vertical;	m2	119		
	Marble wall finish				
	Supply and fix polished and sealed coloured or white marble from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting ; generally to				
	25 mm thick; butt joints straight both ways				
D	Walls; vertical;	m2	100		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	To waterfeature	m2	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ACOUSTIC FOAM PADDING</u>				
	Supply and fix acoustic foam padding to walls comprising of 50mm thick compressed high density foam from Jumbo Chem Kenya Ltd or other equal and approved; fixed on and including 6mm thick high quality plywood nailed on and including 50x50mm thick cypress framework; complete with high quality leather with buttons as cover to compressed hexafoam; complete with and including 75x50mm thick varnished mahogany moulded beadings between foam paddings at horizontal and vertical at 500mm centres; secret nailing; including varnishing frames to approval				
A	To plastered surfaces	m2	176		
	<u>ACOUSTIC PANELS</u>				
B	50mm thick acoustic wall panel including fixing to walls in approved adhesive or hooking; fixing according to manufacturer's specification	m2	50		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
C	Walls; vertical; internal	m2	7,827		
D	Columns; vertical; internal	m2	1,623		
E	Gypsum partitions	m2	896		
F	Lift shaft and shear walls internally	m2	826		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT		
	INTERNAL WALL FINISHES COLLECTION PAGE						
	Total Brought Forward from Page No.		Page No. 11/26 11/27 11/28				
TOTAL FOR SEVENTH FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11					<table border="1"> <tr> <td></td> </tr> <tr> <td></td> </tr> </table>		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	274		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
B	Generally to external walls	m2	1,228		
C	Ditto to beams	m2	392		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D	To plastered external walls	m2	1,228		
E	To plastered beams	m2	392		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	142		
B	<p>To plastered concrete upstands</p>	m2	142		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	<p>Curtain walling generally; diagonal sections; curved to profile</p> <p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>	m2	1,200		
B	Window size 1200 x 1200 mm high	No	90		
C	Window size 1050 x 1050 mm high	No	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/30 11/31 11/32		
	TOTAL FOR SEVENTH FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	385		
B	Ditto to receive granite tiles	m2	296		
D	Ditto to receive porcelain tiles	m2	2,317		
E	Ditto to receive carpet	m2	185		
F	Ditto to receive non-slip acidic resistant /anti-corrosive tiles ceramic tiles	m2	330		
G	Ditto to receive engineered wood flooring	m2	399		
H	Ditto to receive acoustic floor panels	m2	36		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
H	Floors; level; internal;	m2	385		
I	18 mm thick x 150mm high skirting; floor; internal	m	397		
J	25 x 15 mm solid brass decorative strip to tiled floor	m	200		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
K	Floors; level; internal;	m2	296		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	25 mm thick x 150mm high skirting; floor; internal Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to 18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to	m	172		
B	Floors; level; internal;	m2	2,317		
C	18 mm thick x 150mm high skirting; floor; internal	m	923		
D	25 x 15 mm solid brass decorative strip to tiled floor Fitted carpet Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yarn weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval	m	100		
E	To screeded floor Mahogany timber skirting	m2	185		
F	150 x 25mm thick moulded timber skirting Raised floor panels Supply and fix raised acoustic floor panels size 600x600mm thickness between 50-60mm; to provide functions such as air conditioning and load bearing capacity. With point load of 10000N ; to be flexible, abrasion resistant, non magnetic and anti-static; complete with pedestal and all jointing materials.	m	117		
G	To screeded floor Carried to Collection	m2	36		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	150 x 25mm thick matching skirting Acid resistant ceramic tiles Supply and fix approved non-slip acid resistant/anti-corrosive ceramic tile from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to 18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to	m	37		
B	Floors; horizontal	m2	330		
C	18 mm thick x 150mm high skirting; floor; internal Engineered wood flooring Supply and install 25mm thick imported engineered pre-painted assembly finished wood flooring 600 x 100mm wide flooring boards in approved joining mechanism complete with and including "Jumbolene" floor underlay or other equal and approved; all to architect's specifications and approval	m	215		
D	To screeded floor	m2	399		
E	150 x 25mm thick moulded mahogany timber skirting PAINTING AND DECORATION Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-	m	284		
F	Surfaces over 100mm but not exceeding 200mm girth Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-	m	401		
G	Timber surfaces between 100-200 mm girth	m	401		
H	To general timber surfaces	m2	399		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/34 11/35 11/36		
	TOTAL FOR SEVENTH FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	314		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	314		
C	18 mm thick x 150mm high skirting; floor;external	m	393		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	373		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Floors; horizontal; over 300 mm	m2	373		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	210mm diameter rainwater downpipe: fixed to wall using brackets	m	64		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	16		
F	Rainwater shoe	No	16		
G	Rainwater outlets: 210mm diameter	No	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	16		
B	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	16		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			11/39		
			11/40		
			11/41		
	TOTAL FOR SEVENTH FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	2,552		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in coval,circular,square and rectangular shape etc	m	1,223		
C	Moisture resistant gypsum ceiling	m2	123		
C	Cornices 150 x 25 mm polyurethane cornice	m	1,614		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	646		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	154		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	79		
G	Sides of beams; horizontal; Internal	m2	4,232		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	79		
B	Beams; horizontal; Internal	m2	4,232		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	3,164		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	531		
E	Ditto perforated for backlighting	m2	100		
	MDF laser cut out ceilings				
F	Supply and fix 18mm thick MDF laser cut out ceiling to Architect's details	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/42		
			11/43		
TOTAL FOR SEVENTH FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	52		
B	Sides of beams; horizontal; external	m2	196		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth				
	other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; external	m2	52		
D	Beams; horizontal; external	m2	196		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	314		
F	Ditto perforated for backlighting	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/45		
	TOTAL FOR SEVENTH FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	308		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	576		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	308		
	Vanity Cabinets				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details				
D	Vanity cabinets overall size :average length 5200mm x 600mm wide x 900mm high	No	2		
E	Ditto :average length 3600mm x 600mm wide x 900mm high	No	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Ditto :average length 1700mm x 600mm wide x 900mm high Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.	No	2		
B	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	19		
C	20 x 100 mm granite fascia Cabinets Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details	m	31		
D	Low level cabinet overall size :overall length 5200mm x 600mm wide x 900mm high at dispense bar and live cooking Cabinet worktop: 600mm wide : with round edges : form holes for kitchen sink.	No	2		
E	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	7		
F	20 x 100 mm granite fascia	m	11		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p>				
A	<p>High level kitchen cabinet : overall size: length 2500mm x 300mm wide x 800mm high</p>	No	2		
	<p>Shelving at stores</p>				
B	<p>5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	55		
	<p>Wardrobes</p>				
	<p>Wardrobes: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, drawers, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges,sliding mechanism, chrome pipes hanging rail,shoe rack, aluminium D pul handles, drawer locks,magnetic ball catches and all other necessary ironmongery.</p>				
C	<p>Wardrobes overall size 7500 x 600mm wide x 4300mm high</p>	No	2		
D	<p>Wardrobes overall size 2500 x 600mm wide x 4300mm high</p>	No	6		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sliding glass shower cubicle comprising of 12mm thick toughened glass size 1500 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	6		
B	Ditto size 2400 x 2400mm high; complete with patch fittings, stainless steel handles and all necessary ironmongery	No	2		
	Open 'U' drainage				
C	300mm wide(internal) open 'U' drain comprising of 700mm wide x 250mm thick concrete base; 500mm high x 200mm thick insitu class 35 concrete walls average 450mm high; including internal plaster, reinforcement and formwork	m	80		
	Mild steel grating at kitchen				
D	500mm wide mild steel channel grating : comprising 40 x 40 x 6mm edge frame : infilled with 40 x 6mm flats at 50mm centres : 40 x 40 x 6mm frame set in concrete with 150mm long mild steel end split lugs : smooth weld joints; red oxide primer: two coats gloss paint finish :	m	80		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 11/47 11/48 11/49 11/50		
	TOTAL FOR SEVENTH FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 11				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 14				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	Sundries				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	ALUMINIUM COMPOSITE CLADDING				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	740		
TOTAL FOR SEVENTH FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 11					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 15</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	<p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
<p>TOTAL FOR SEVENTH FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 11</p>					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 11				
	SEVENTH FLOOR				
	<u>SECTION SUMMARY- SEVENTH FLOOR</u>				
1	FRAME	Page	11/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	11/9		
3	INTERNAL WALLING	Page	11/12		
4	EXTERNAL WALLING	Page	11/13		
5	DOORS AND ASSOCIATED FINISHES	Page	11/22		
6	WINDOWS AND ASSOCIATED FINISHES	Page	11/25		
7	INTERNAL WALL FINISHES	Page	11/29		
8	EXTERNAL WALL FINISHES	Page	11/33		
9	INTERNAL FLOOR FINISHES	Page	11/37		
10	EXTERNAL FLOOR FINISHES	Page	11/41		
11	INTERNAL CEILING FINISHES	Page	11/44		
12	EXTERNAL CEILING FINISHES	Page	11/46		
13	FITTINGS	Page	11/51		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	11/52		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	11/53		
	Carried to Final Summary				
	Section No. 11				
	SEVENTH FLOOR				

EIGHTH FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 12</u>				
	<u>EIGHTH FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 35/20mm : Vibrated				
	Beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	9		
B	Beams; tank bearers	m3	13		
	Gutter beams				
C	Gutter Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	40		
	Columns				
D	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	3		
	Suspended solid floor slab-STAIRCASE/MACHINE ROOM				
E	200 mm thick ; horizontal	m2	197		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
F	250 mm thick ; horizontal	m2	197		
	To edges of suspended floor slab				
G	Girth 175 mm to 250 mm	m	101		
	To vertical or battering sides				
H	Columns or the like; vertical and curved	m2	10		
I	Vertical sides and soffits of beams	m2	241		
J	Stepped sides of moulded gutter beams;2 no steps 1no chamfer; overall 1950mm girth	m2	86		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.</p> <p>Assorted sizes(T8-T40mm bars)</p>	kg	10,490		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			12/1		
			12/2		
	TOTAL FOR EIGHTH FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 12				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 2</u></p> <p><u>INTERNAL WALLING</u></p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	100		
	<p>TOTAL FOR EIGHTH FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 12</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>EXTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	200		
B	Ditto parapet walls	m2	400		
	Precast concrete class 20 (12mm,aggregate) including formwork, finishing fair face on all exposed surfaces, and bedding and jointing in cement and sand (1:3) mortar				
C	300x45mm thick copings; once weathered and throated	m	315		
	TOTAL FOR EIGHTH FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 12				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	MILD STEEL DOORS				
	Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Single leaf door overall size 1000mm wide x 2700mm high	No	3		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
A	Over 300 mm ; Internally	m2	22		
B	Over 300 mm ; externally	m2	22		
	TOTAL FOR EIGHTH FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 5				
	INTERNAL WALL FINISHES				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	400		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
B	Walls; vertical; internal	m2	400		
TOTAL FOR EIGHTH FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 6				
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	600		
B	Ditto to beams	m2	45		
	Specialist applied textured finish as 'Marmoran" supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	600		
D	To plastered beams	m2	45		
TOTAL FOR EIGHTH FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	20		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; internal;	m2	20		
C	18 mm thick x 150mm high skirting; floor; internal	m	5		
TOTAL FOR EIGHTH FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 8</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive precast concrete interlocking tiles	m2	3,270		
	200 x 200 x 12mm Thick precast interlocking concrete tiles laid on cement and sand screed (m.s) as described on				
B	Floors; level; external;	m2	3,270		
C	12mm thick x 150mm high skirting; floor;external	m	625		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	3,609		
B	Gutters	m2	178		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer's printed instructions				
C	Floors; horizontal; over 300 mm	m2	3,609		
D	Gutters	m2	178		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
F	210mm diameter rainwater downpipe: fixed to wall using brackets	m	16		
	Extra for:				
G	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Rainwater shoe	No	4		
B	Rainwater outlets: 210mm diameter	No	4		
C	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	16		
D	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	16		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 12/10 12/11 12/12		
TOTAL FOR EIGHTH FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12					<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling and soffits of beams; horizontal; internal	m2	197		
G	Sides of beams; horizontal; Internal	m2	46		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	197		
B	Beams; horizontal; Internal	m2	46		
	TOTAL FOR EIGHTH FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 10</u></p> <p><u>EXTERNAL CEILING FINISHES</u></p> <p><u>ROOF SKYLIGHTS</u></p> <p>Supply and fix 18mm thick toughened safety glass (6mm+6mm+6mm) as supplied by Impala Glass Industries Kenya Ltd or other equal and approved; including polyvinyl butuyral (PVB) film solar glass fixed on and including 75x75x3mm thick SHS mild steel trusses finished in zinc chromate primer and two coats of gloss oil paint; fixed in accordance with manufacturer's recommendations as described on:-</p>				
A	To skylight at atrium	m2	300		
	<p>TOTAL FOR EIGHTH FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 12</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	Structural mild steel to BS 4360 grade 43C: allow for 8FW continuous welding : 3mm blanked open ends : one coat zinc chromate primer : including drilling holes in steel and haunching: all connections, cleats, bolts, nuts, washers etc; to Engineer's detail				
A	200 x 100 x 5mm RHS	Kg	14,922		
B	75 x 75 x 5mm RHS	Kg	28,095		
	<u>Sundries</u>				
C	200 x 200 x 6mm thick angle cleats; with 4no. holes	No	200		
D	12mm dia x 430mm long bolt; complete with nut and washers	No	800		
	Prepare, touch up primer and apply zinc chromate primer and two coats of gloss oil paint finish				
E	General surface of steel members	m2	492		
	ALUMINIUM COMPOSITE CLADDING				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
F	Butt joints; over 300mm wide	m2	983		
	TOTAL FOR EIGHTH FLOOR -STRUCTURAL STEEL CARRIED FORWARD TO SUMMARY OF SECTION NO. 12				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 12</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR EIGHTH FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 12</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 12				
	EIGHTH FLOOR				
	<u>SECTION SUMMARY- EIGHTH FLOOR</u>				
1	FRAME	Page	12/3		
3	INTERNAL WALLING	Page	12/4		
4	EXTERNAL WALLING	Page	12/5		
5	DOORS AND ASSOCIATED FINISHES	Page	12/6		
7	INTERNAL WALL FINISHES	Page	12/7		
8	EXTERNAL WALL FINISHES	Page	12/8		
9	INTERNAL FLOOR FINISHES	Page	12/9		
10	EXTERNAL FLOOR FINISHES	Page	12/13		
11	INTERNAL CEILING FINISHES	Page	12/14		
12	EXTERNAL CEILING FINISHES	Page	12/15		
14	STRUCTURAL STEEL AND ASSOCIATED FINISHES	Page	12/16		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	12/17		
	Carried to Final Summary				
	Section No. 12				
	EIGHTH FLOOR				

SUMMARY

CONFERENCE, ADMINISTRATION AND ACCOMMODATION BLC

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ICK

ITEM	DESCRIPTION	UNIT	QTY	FOR CONTRACTOR'S USE	FOR CONSULTANTS' USE
	SECTION NO. 15				
	MAIN BUILDING SUMMARY PAGE				
	Total Brought Forward from Page No.		Page No.		
1.	BASEMENT		3/37		
3.	GROUND FLOOR		4/64		
4.	1ST FLOOR		5/54		
5.	2ND FLOOR		6/56		
6.	3RD FLOOR		7/54		
7.	4TH FLOOR		8/55		
8.	5TH FLOOR		9/54		
9.	6TH FLOOR		10/60		
10.	7TH FLOOR		11/54		
11.	8TH FLOOR		12/18		
	Carried to Grand Summary		Ksh		
	Section No. 15 MAIN BUILDING SUMMARY				

CLUB HOUSE

Note:

1. The rates and prices shall be inclusive of VAT at 16%

GROUND FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.16				
	GROUND FLOOR				
	ELEMENT NO 1				
	SUBSTRUCTURES (All Provisional)				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	1,200		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	1,200		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	1,200		
	Pits ; to receive isolated bases or the like; starting from reduced level:-				
D	Not exceeding 1.5m deep	m3	264		
E	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	264		
	Lift shaft Pits ; to receive isolated bases or the like; starting from reduced level:-				
F	Not exceeding 1.5m deep	m3	20		
G	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	20		
	Foundation strips; starting from reduced level:-				
H	Not exceeding 1.5m deep	m3	282		
I	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	282		
	Extra over all kinds of excavation irrespective of depth for:-				
J	All kinds of rock	m3	237		
	DISPOSAL				
	Surplus excavated materials				
K	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	2,569		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Backfill material				
A	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	1,200		
B	Return, fill and ram selected excavated materials in layers maximum 150 mm thick	m3	1,200		
	Disposal of water				
C	Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
	Plunking and strutting				
D	Planking and strutting to sides of all excavations : keep excavations free from all fallen materials	Item	1		
	FILLING				
	Hardcore				
	Supply approved hardcore on site or other equal and approved base material in making up levels.				
E	500mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	479		
	Stone or quarry dust				
	Blinding surfaces of fill				
F	50 mm thick	m2	958		
	ANTI TERMITE AND HERBICIDE TREATMENT				
	Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
G	To surfaces of blinded hardcore	m2	1,020		
	Damp-proof membranes				
H	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	1,020		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	CONCRETE WORK				
	Insitu blinding ; mass concrete ; class 15/25mm				
A	Foundation strip	m2	188		
B	Bases	m2	44		
C	Lift shaft bases	m2	11		
	Insitu ; mass concrete ; class 25/25mm				
D	Strip Footing	m3	38		
E	Bases	m3	71		
F	Lift shaft bases	m3	6		
G	Columns; Vertical or sloping exceeding 15 degrees from horizontal	m3	12		
H	300mm thick lift shaft walls	m3	8		
I	200mm thick ground floor slab	m2	1,020		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
J	Assorted sizes(T8-T25mm bars)	kg	31,624		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
K	In ground floor slab	m2	1,020		
	FORMWORK TO INSITU CONCRETE				
	Edges of ground floor slab				
L	150 to 225 mm wide	m	47		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Sides ; vertical or battering				
A	Columns or the like	m2	108		
B	Circular curved columns	m2	40		
C	Column bases	m2	141		
D	Lift shaft bases	m2	7		
D	Lift shaft walls	m2	52		
E	Strip footing	m2	126		
	Foundation Walling				
	Selected approved quality natural quarry stone fine hand dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks: : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to				
F	200mm Thick skin walling	m2	626		
	Plinth treatment				
G	12mm thick cement and sand (1:4) render to plinths	m2	100		
H	Prepare and apply two coats of bituminous emulsion to rendered surfaces	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.16				
	SUBSTRUCTURE				
	<u>SECTION SUMMARY-SUBSTRUCTURE</u>				
	Total Brought Forward from Page No.		Page No.		
			16/1		
			16/2		
			16/3		
			16/4		
	TOTAL FOR SUBSTRUCTURES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 2				
	FRAME				
	INSITU CONCRETE : REINFORCED Normal; class 25/20mm : Vibrated				
	Steps				
A	Steps at entrances	m3	15		
	Beams				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	68		
	Down stand beams at sunshade				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	25		
	Columns				
D	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	26		
	Lift shaft walls				
E	300 mm thick	m3	19		
	Suspended solid floor slab				
F	250 mm thick ; horizontal	m2	804		
	Ramp 1:12				
G	200 mm thick	m2	35		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	804		
	To edges of suspended floor slab				
B	Girth 150 mm to 225 mm	m	201		
	To edges of ramp				
C	Girth 150 mm to 225 mm	m	65		
	Risers of steps				
D	Girth 75mm to 150mm	m	286		
	Waist of stairs; to profile of steps				
E	To edges of waists of steps cut to profile of steps - 500 mm wide extreme	m	16		
	Sides of steps				
F	To sides of steps	m2	27		
	To vertical or battering sides				
G	Columns or the like; vertical and curved	m2	144		
H	Circular curved columns	m2	70		
I	Lift walls	m2	128		
J	Edges of lift shaft walls	m	3		
	To sides and soffits				
K	Beams or the like; Horizontal	m2	569		
L	Down stand beams; horizontal	m2	120		
	Edges of lift wall openings				
M	Girth exceeding 225 mm but not exceeding 300 mm	m	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
A	Assorted sizes(T8-T16mm bars)	kg	43,934		
	EXPANSION JOINTS				
B	Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes	m	45		
C	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	27		
D	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/6		
			16/7		
			16/8		
	TOTAL FOR GROUND FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 3				
	STAIRCASES AND STAIRCASE FINISHES				
	INSITU CONCRETE : REINFORCED				
	Normal; class 25/20mm; Vibrated				
A	Steps, staircases or strings	m3	5		
B	250 mm thick concrete landings	m2	8		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	910		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	47		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	12		
	Vertical edge : suspended landing :				
F	Over 150mm but not exceeding 225mm high	m	8		
	To soffits; horizontal				
G	Landing	m2	8		
	Soffits; sloping				
H	Waists of stairs and the like	m2	11		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	METAL WORK				
	BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to 50mm x 12mm thick stainless steel double flat bar vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1025mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete reinforcement and at the top 3mm thick x 50mm diameter oval stainless steel handrail tube ; including all necessary cleats, stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail	m	35		
	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	30		
B					
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES				
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide with bull nosings (rounded and double granite edges) full length slab	m	47		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	94		
C	To risers; 150 mm high full length slab	m	47		
D	To landing; tiles to approved sizes and pattern	m2	8		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	47		
F	Ditto to edges of landing; 225mm high full length slab	m	8		
G	25 mm thick x 150 mm high matching skirting to stairs; internal	m	82		
H	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 25mm thick granite slab finish (m/s)	m	47		
	BEDS OR BACKINGS				
	Screed ; Cement sand backing (1:4)				
	40 mm thick one coat beds; wood floated to receive granito tiles (m/s) to concrete or block work base; generally to				
I	Treads; 300 mm wide; internal	m	47		
J	Risers; 150 mm high; internal	m	47		
K	Landing	m2	8		
L	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	47		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	11		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	8		
C	To open edges of landing Girth 150 to 225mm; internal	m	8		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	12		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
E	To steel trowelled plastered surfaces Soffits of stairs; sloping Over 300mm girth; internal	m2	11		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	8		
G	To open edges of landing Girth 150 to 225mm; internal	m	8		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	12		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/10 16/11 16/12 16/13		
	TOTAL FOR GROUND FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	373		
B	100mm thick walls	m2	269		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
C	200mm wide	m	112		
D	100mm wide	m	91		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>INTERNAL PARTITIONING</u>				
	FRAMELESS GLASS PARTITION				
A	Supply, assemble and fix 3600 mm high 12mm thick laminated glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	65		
	GLASS FILMS				
B	Supply and fix 10 UM coloured vinyl film or sand blast film with client's logo and graphics from an approved supplier as per as per Architect's details	m2	65		
	<u>HDF PARTITIONS</u>				
C	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/15		
			16/16		
	TOTAL FOR GROUND FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>EXTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	530		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m2	151		
	TOTAL FOR GROUND FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	118		
B	Ditto transomes	m	51		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	187		
D	Ditto transomes	m	24		
	Architraves				
E	75 x 25 mm moulded	m	305		
	Quadrants				
F	25 x 25 mm	m	305		
	Beading; To fanlight				
G	25 x 25 mm	m	145		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	228		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	228		
	WPC Door Quadrants				
J	50 x 25 mm	m	228		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 3800 mm wide x 2700 mm high	No	1		
B	Ditto Overall size 2400 mm wide x 2700 mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>MILD STEEL DOORS</p> <p>Mild steel louvred double leaf door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth</p>				
A	Overall size 4000 mm wide x 2700 mm high	No	1		
B	Ditto 2000 mm wide x 2700 mm high	No	1		
C	Ditto 1000 mm wide x 2700 mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
A	Single door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	36		
B	Ditto overall size 800 mm wide x 2400 mm high openable door (Duct doors)	No	5		
C	Single leaf Double Swing overall size 1000 mm wide x 2400 mm high openable door (pwd)	No	4		
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
D	Single leaved hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	10		
E	Single leaved double swing overall size 1000 x 2400mm high	No	8		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>FLUSH DOORS</p> <p>Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door</p> <p>A Single door leaved overall size 900 x 2700mm high</p>	No	36		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2700mm high	No	5		
	<u>IRONMONGERY</u>				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
B	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	15.0		
C	Ditto 100mmx3.25mm	Pairs	69.0		
D	150mm heavy duty double action spring hinges	Pairs	8		
E	32x600mm high satin stainless steel straight pull handles back to back to approval	No	115		
F	Stainless steel push plate-100x300mm	No	115		
G	Stainless steel pull plate-100x300mm	No	115		
H	19x225mm high S.S conceal fix pull handles	No	115		
G	Stainless steel Abloy handles on Rose	No	28		
H	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	28		
I	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	36		
J	5-Lever mortice lock complete with aluminium lever handles	No	18		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Satin Nickel 70mm Euro restricted Double cylinder	No	47		
B	Oval satin nickel floor mounted door stop fixed with screw to approval	No	73		
C	800 x 200mm high stainless steel kick plate onto both sides to approval	No	108		
D	Satin steel Euro profile escutcheons	No	47		
E	Assa Abbloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	26		
F	Coat and hat hook with rubber tip in stainless steel finish	No	54		
G	Indicator lock 'Vacant / Engaged'	No.	42		
H	Indicator lock 'Vacant / Engaged'-disabled	No.	2		
I	200x300mm high stainless steel transfer grills	No.	108		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
J	Door frame; 200 mm to 300 mm	m	346		
K	Door frame; 100 mm to 200 mm	m	187		
L	Architraves girth not exceeding 100 mm	m	533		
M	Quadrants/Beading girth not exceeding 100 mm	m	533		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
A	Door frame; 200 mm to 300 mm	m	608		
B	Architraves girth not exceeding 100 mm	m	761		
C	Quadrants/beading girth not exceeding 100 mm	m	450		
D	General surfaces of wood	m2	416		
	<u>GLAZING</u>				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
E	In panes not exceeding 0.50 square meters	m2	22		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/19 16/20 16/21 16/22 16/23 16/24 16/25 16/26		
	TOTAL FOR GROUND FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 7				
	WINDOWS AND ASSOCIATED FINISHES				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 6000 x 2400 mm high with 2 No. equal top hung openable casement size 2000 x 2000 mm high and 2No fixed lights size 2000 x 700mm high	No	4		
B	Window overall size 2100 x 2400 mm high ditto	No	2		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
C	250 x 25mm Window board	m	33		
D	20 x 25mm Quadrant beading	m	33		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
A	100 x 18mm full length slab; weathered and throated smooth "Jet Black" granite window cill bedded and jointed with cement sand (1:4) mortar	m	25		
B	300 x 18mm thick full length slab; bull-nosed jet black granite window board	m	25		
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Back of wood frames over 200mm but not exceeding 300mm girth	m	33		
D	Ditto: 0-100 mm girth	m	33		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
E	Timber surfaces between 200-300mm girth	m	33		
F	Ditto: 0-100 mm girth	m	33		
	WINDOW BLINDS				
G	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/transluscent heavy fire retardant fabrics complete with rings,rollers brass I section rails and all other necessary accessories	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/28 16/29		
	TOTAL FOR GROUND FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	INTERNAL WALL FINISHES				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	1,814		
B	Ditto columns; vertical; internally	m2	160		
C	Lift shaft internally	m2	20		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally				
D	Walls; vertical; internal	m2	538		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	Walls; vertical; internal	m2	538		
F	Extra over for 100 mm wide decorative tile to approval	m	650		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Walls; vertical;	m2	56		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	7		
	ALUMINIUM COMPOSITE CLADDING				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
C	Butt joints; over 300mm wide	m2	230		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
D	Walls; vertical; internal	m2	1,814		
E	Columns; vertical; internal	m2	160		
F	Lift shaft internally	m2	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/31		
			16/32		
	TOTAL FOR GROUND FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 9				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	Supply, assemble and fix 1250mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to 50mm x 12mm thick stainless steel double flat bar vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1025mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete reinforcement and at the top 3mm thick x 50mm diameter oval stainless steel handrail tube ; including all necessary cleats, stiffeners and the like; all to Architect's instructions and approval				
A	1250 mm high to detail	m	41		
B	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	41		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	25 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
C	Generally to external walls and concrete surfaces	m2	530		
	Specialist applied textured finish as 'Marmoran' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D.	Concrete surfaces;externally	m2	530		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	<p>Curtain walling generally; diagonal sections; curved to profile</p> <p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>	m2	180		
B	Window size 975 x 1050 mm high	No	15		
C	Window size 890 x 1050 mm high	No	15		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/34		
			16/35		
	TOTAL FOR GROUND FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	INTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	235		
B	Ditto to receive marble tiles	m2	40		
C	Ditto to receive porcelain tiles	m2	507		
D	Ditto to receive carpet finish	m2	41		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	Floors; level; internal;	m2	235		
F	18 mm thick x 150mm high skirting; floor; internal	m	120		
G	25 x 15 mm solid brass decorative strip to tiled floor	m	235		
	Supply and fix polished and sealed coloured or white marble slab from an approved source laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
H	Floors; level; internal;	m2	40		
I	20 mm thick x 150mm high skirting; floor; internal	m	17		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
A	Floors; level; internal;	m2	507		
B	18 mm thick x 150mm high skirting; floor; internal	m	749		
C	25 x 15 mm solid brass decorative strip to tiled floor	m	335		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yard weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
D	To screeded floor	m2	41		
	<p>Mahogany timber skirting</p>				
E	150 x 25mm thick moulded timber skirting	m	88		
	<p>Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-</p>				
F	Surfaces over 100mm but not exceeding 200mm girth	m	88		
	<p>Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-</p>				
G	Timber surfaces between 100-200 mm girth	m	88		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/37		
			16/38		
	TOTAL FOR GROUND FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Ditto to receive marble tiles	m2	110		
	Supply and fix polished and sealed coloured or white marble slab from an approved source laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
B	Floors; level; internal;	m2	110		
C	25 mm thick x 150mm high skirting; floor; internal	m	110		
	TOTAL FOR GROUND FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	823		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval	m	705		
	Cornices				
C	150 x 25 mm polyurethane cornice	m	278		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	60		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
A	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	823		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
B	Butt joints; over 300mm wide	m2	250		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/41		
			16/42		
	TOTAL FOR GROUND FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 13</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes; comprising of normal PE core, aluminium panel, primer, paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
A	Butt joints; over 300mm wide	m2	110		
B	Ditto perforated for backlighting	m2	50		
TOTAL FOR GROUND FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 14				
	FITTINGS				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	35		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	29		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	35		
	Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.				
D	600mm wide x 20mm thick granite top as before described; fixed with cement sand mortar mix (1:4) : with round edges :allow to form holes for sink	m2	10		
E	20 x 100 mm granite fascia	m	15		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	KITCHEN CABINETS				
	Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details				
A	Low level kitchen cabinet overall size :overall length 5000mm x 600mm wide x 900mm high	No	6		
	Kitchen worktop: 600mm wide : with round edges : form holes for kitchen sink.				
B	600mm wide x 20mm thick granite top as before described; fixed with cement sand mortar mix (1:4) : with round edges :allow to form holes for kitchen sink	m2	35		
C	20 x 100 mm granite fascia	m	59		
	High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery				
D	High level kitchen cabinet : overall size: length 2000mm x 300mm wide x 800mm high	No	5		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Shelving at stores</p>				
A	<p>5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	45		
	<p>Open 'U' drainage</p>				
B	<p>300mm wide(internal) open 'U' drain comprising of 700mm wide x 250mm thick concrete base; 500mm high x 200mm thick insitu class 35 concrete walls average 450mm high; including internal plaster, reinforcement and formwork</p>	m	20		
	<p>Mild steel grating at kitchen</p>				
C	<p>500mm wide mild steel channel grating : comprising 40 x 40 x 6mm edge frame : infilled with 40 x 6mm flats at 50mm centres : 40 x 40 x 6mm frame set in concrete with 150mm long mild steel end split lugs : smooth weld joints; red oxide primer: two coats gloss paint finish :</p>	m	20		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/45		
			16/46		
			16/47		
	TOTAL FOR GROUND FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 15</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc				
A	Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces	Item	1		
	TOTAL FOR SECOND FLOOR -BWICWS CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.16				
	GROUND FLOOR				
	<u>SECTION SUMMARY- GROUND FLOOR</u>				
1	SUB-STRUCTURE	Page	16/5		
2	FRAME	Page	16/9		
3	STAIRCASE AND STAIRCASE FINISHES	Page	16/14		
4	INTERNAL WALLING	Page	16/17		
5	EXTERNAL WALLING	Page	16/18		
6	DOORS AND ASSOCIATED FINISHES	Page	16/27		
7	WINDOWS AND ASSOCIATED FINISHES	Page	16/30		
8	INTERNAL WALL FINISHES	Page	16/33		
9	EXTERNAL WALL FINISHES	Page	16/36		
10	INTERNAL FLOOR FINISHES	Page	16/39		
11	EXTERNAL FLOOR FINISHES	Page	16/40		
12	INTERNAL CEILING FINISHES	Page	16/43		
13	EXTERNAL CEILING FINISHES	Page	16/44		
14	FITTINGS	Page	16/48		
15	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	16/49		
	Carried to Final Summary				
	SECTION NO.16				
	GROUND FLOOR				

FIRST FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.16				
	FIRST FLOOR				
	ELEMENT NO 1				
	FRAME				
	INSITU CONCRETE : REINFORCED				
	Normal; class 25/20mm : Vibrated				
	Beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	68		
	Down stand beams at sunshade				
B	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	25		
	Columns				
C	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	26		
	Lift shaft walls				
D	300 mm thick	m3	19		
	Suspended solid floor slab				
E	250 mm thick ; horizontal	m2	804		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	804		
	To edges of suspended floor slab				
B	Girth 150 mm to 225 mm	m	201		
	To vertical or battering sides				
C	Columns or the like; vertical and curved	m2	144		
D	Circular curved columns	m2	70		
E	Lift walls	m2	64		
E	Edges of lift shaft walls	m	3		
	To sides and soffits				
F	Beams or the like; Horizontal	m2	569		
G	Down stand beams; horizontal	m2	120		
	Edges of lift wall openings				
H	Girth exceeding 225 mm but not exceeding 300 mm	m	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
A	Assorted sizes(T8-T25mm bars)	kg	42,184		
	EXPANSION JOINTS Form or leave 30 mm thick joint in 250mm thick reinforced concrete slab,walls and columns (m/s) including all necessary formwork and forming holes				
B		m	45		
C	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	27		
D	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	45		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/1		
			16/2		
			16/3		
	TOTAL FOR FIRST FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 2				
	STAIRCASES AND STAIRCASE FINISHES				
	INSITU CONCRETE : REINFORCED				
	Normal; class 25/20mm; Vibrated				
A	Steps, staircases or strings	m3	5		
B	250 mm thick concrete landings	m2	8		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes(T8-T16mm bars)	Kg	890		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Risers of steps and staircases				
D	Girth 75m m to 150mm	m	47		
	Waist of stairs; to profile of steps				
E	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	12		
	Vertical edge : suspended landing :				
F	Over 150mm but not exceeding 225mm high	m	8		
	To soffits; horizontal				
G	Landing	m2	8		
	Soffits; sloping				
H	Waists of stairs and the like	m2	11		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>METAL WORK</p> <p>BALUSTRADES</p> <p>ROLLED PLATES, BARS, SECTIONS AND TUBES</p> <p>GLASS BALUSTRADES</p> <p>ROLLED PLATES, BARS, SECTIONS AND TUBES</p> <p>GLASS BALUSTRADES</p> <p>Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to 50mm x 12mm thick stainless steel double flat bar vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1025mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete reinforcement and at the top 3mm thick x 50mm diameter oval stainless steel handrail tube ; including all necessary cleats, stiffeners and the like; all to Architect's instructions and approval</p>				
A	1150 mm high to detail	m	35		
B	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	30		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE FINISHES Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
A	To treads; 300 mm wide with bull nosings (rounded and double granite edges) full length slab	m	47		
B	Extra over treads for 2 No. water drip on either sides of every step each 150 mm long x 300 mm wide in granite	m	94		
C	To risers; 150 mm high full length slab	m	47		
D	To landing; tiles to approved sizes and pattern	m2	8		
E	To edges of waists of stairs in one continuous slab cut to profile of steps-350 mm wide extreme	m	47		
F	Ditto to edges of landing; 225mm high full length slab	m	8		
G	25 mm thick x 150 mm high matching skirting to stairs; internal	m	82		
H	Extra; 3 No.5 mm wide x 3 mm deep anti slip grooves cut into 25mm thick granite slab finish (m/s)	m	47		
	BEDS OR BACKINGS Screed ; Cement sand backing (1:4) 40 mm thick one coat beds; wood floated to receive granito tiles (m/s) to concrete or block work base; generally to				
I	Treads; 300 mm wide; internal	m	47		
J	Risers; 150 mm high; internal	m	47		
K	Landing	m2	8		
L	To edges of waists of stairs cut to profile of steps - 350 mm wide extreme	m	47		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INSITU FINISHES				
	Lime plaster ; cement and sand (1:4) ; steel trowelled ; hard and smooth 20mm thick 2 no coat work ; to concrete or block work base (m/s) generally to;				
A	Soffits of stairs; sloping Over 300mm girth; internal	m2	11		
B	Soffits of landing; horizontal Over 300mm girth; internal	m2	8		
C	To open edges of landing Girth 150 to 225mm; internal	m	8		
D	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	12		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
E	To steel trowelled plastered surfaces Soffits of stairs; sloping Over 300mm girth; internal	m2	11		
F	Soffits of landing; horizontal Over 300mm girth; internal	m2	8		
G	To open edges of landing Girth 150 to 225mm; internal	m	8		
H	To open string of staircase Open strings of staircases; 225 to 300mm; internal	m	12		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	STAIRCASE AND STAIRCASE FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/5 16/6 16/7 16/8		
	TOTAL FOR FIRST FLOOR STAIRCASE AND STAIRCASE FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	317		
B	100mm thick walls	m2	229		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>INTERNAL PARTITIONING</u>				
	FRAMELESS GLASS PARTITION				
A	Supply, assemble and fix 3600 mm high 12mm toughened glass partition fixed to upstand masonry wall (m/s) ; complete with 60mm dia stainless steel vertical members at 1200mm centres fixed using and including 200x200x6mm thick steel base plate;complete with 200mm high openable 6mm thick clear glass louvers; including all necessary accessories	m2	65		
	GLASS FILMS				
B	Supply and fix 10 UM coloured vinyl film or sand blast film from an approved supplier as per as per Architect's details	m2	65		
	<u>HDF PARTITIONS</u>				
C	Supply and fix 20mm thick HDF partitions; complete with all fittings including stainless steel anchor bolted to concrete floor; colour to Architect's approval	m2	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALLING COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/10		
			16/11		
	TOTAL FOR FIRST FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 4</u></p> <p><u>EXTERNAL WALLING</u></p> <p>BLOCKWORK Machine cut natural stone or concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar 200 mm thick walls</p>	m2	530		
	<p>TOTAL FOR FIRST FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO.16</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	56		
B	Ditto transomes	m	25		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	101		
D	Ditto transomes	m	18		
	Architraves				
E	75 x 25 mm moulded	m	157		
	Quadrants				
F	25 x 25 mm	m	157		
	Beading; To fanlight				
G	25 x 25 mm	m	145		
	WPC Door frame moulded to approval				
H	200 x 50 mm thick , rebated	m	101		
	WPC Door Architraves				
I	75 x 25 mm moulded	m	101		
	WPC Door Quadrants				
J	50 x 25 mm	m	101		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
A	Double leaf door; overall size 3800 mm wide x 2700 mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FIRST QUALITY WPC DOORS				
	Solid core WPC doors; all sides finished with 4mm thick WPC laminate hot pressed in vacuum machine using high quality glue; solid blocking and leaving provision for ironmongery fixing.				
A	Single door; 50mm thick overall size 900 mm wide x 2400 mm high openable door in WCs	No	14		
B	Ditto overall size 800 mm wide x 2400 mm high openable door (Duct doors)	No	5		
C	Single leaf Double Swing overall size 1000 mm wide x 2400 mm high openable door (pwd)	No	1		
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
D	Single leaved hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	4		
E	Single leaved double swing overall size 1000 x 2400mm high	No	4		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>FLUSH DOORS</p> <p>Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door</p> <p>Single door leaved overall size 900 x 2700mm high</p>	No	14		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>DUCT DOORS</u>				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
A	Double leaf door overall size 900 x 2150mm high	No	5		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
B	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	6.0		
C	Ditto 100mmx3.25mm	Pairs	36.0		
D	150mm heavy duty double action spring hinges	Pairs	4		
E	32x600mm high satin stainless steel straight pull handles back to back to approval	No	48		
F	Stainless steel push plate-100x300mm	No	48		
G	Stainless steel pull plate-100x300mm	No	48		
H	19x225mm high S.S conceal fix pull handles	No	48		
G	Stainless steel Abbloys handles on Rose	No	18		
H	Stainless steel Euro cylinder TESA multi bolt deadlock - case only	No	18		
I	Stainless steel Euro cylinder narrow stile lock complete with roller catch and cylinder	No	14		
J	5-Lever mortice lock complete with aluminium lever handles	No	8		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Satin Nickel 70mm Euro restricted Double cylinder	No	47		
B	Oval satin nickel floor mounted door stop fixed with screw to approval	No	32		
C	800 x 200mm high stainless steel kick plate onto both sides to approval	No	44		
D	Satin steel Euro profile escutcheons	No	47		
E	Assa Abloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	9		
F	Coat and hat hook with rubber tip in stainless steel finish	No	22		
G	Indicator lock 'Vacant / Engaged'	No.	20		
H	Indicator lock 'Vacant / Engaged'-disabled	No.	2		
I	200x300mm high stainless steel transfer grills	No.	44		
PAINTING AND DECORATING					
Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-					
Wood surfaces; before fixing					
J	Door frame; 200 mm to 300 mm	m	157		
K	Door frame; 100 mm to 200 mm	m	101		
L	Architraves girth not exceeding 100 mm	m	258		
M	Quadrants/Beading girth not exceeding 100 mm	m	258		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
A	Door frame; 200 mm to 300 mm	m	301		
B	Architraves girth not exceeding 100 mm	m	359		
C	Quadrants/beading girth not exceeding 100 mm	m	302		
D	General surfaces of wood	m2	416		
	<u>GLAZING</u>				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
E	In panes not exceeding 0.50 square meters	m2	22		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/13 16/14 16/15 16/17 16/18 16/19 16/20		
	TOTAL FOR FIRST FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 6				
	WINDOWS AND ASSOCIATED FINISHES				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 6000 x 2400 mm high with 2 No. equal top hung openable casement size 2000 x 2000 mm high and 2No fixed lights size 2000 x 700mm high	No	4		
B	Window overall size 2100 x 2400 mm high ditto	No	2		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
C	250 x 25mm Window board	m	33		
D	20 x 25mm Quadrant beading	m	33		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
A	100 x 18mm full length slab; weathered and throated smooth "Jet Black" granite window cill bedded and jointed with cement sand (1:4) mortar	m	33		
B	300 x 18mm thick full length slab; bull-nosed jet black granite window board	m	33		
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
C	Back of wood frames over 200mm but not exceeding 300mm girth	m	33		
D	Ditto: 0-100 mm girth	m	33		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
E	Timber surfaces between 200-300mm girth	m	33		
F	Ditto: 0-100 mm girth	m	33		
	WINDOW BLINDS				
G	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/transluscent heavy fire retardant fabrics complete with rings,rollers brass I section rails and all other necessary accessories	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/22 16/23		
	TOTAL FOR FIRST FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	1,222		
B	Ditto columns; vertical; internally	m2	160		
C	Lift shaft internally	m2	20		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally				
D	Walls; vertical; internal	m2	458		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	Walls; vertical; internal	m2	458		
F	Extra over for 100 mm wide decorative tile to approval	m	590		
G	Brushed stainless steel edging strip to corners of granito walls	m	350		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Granite wall finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
A	Walls; vertical;	m2	56		
B	25 x 15 mm solid brass decorative strip to tiled walls	m	7		
	ALUMINIUM COMPOSITE CLADDING				
	Supply and fix nano self cleansing perforated aluminium composite cladding sheets in panes sizes ranging from 300 x 300 mm - 1200 x 600 mm ; cutting to sizes comprising of normal PE core, aluminium panel, primer paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved; with matching trim and associated accessories; fixed to and including aluminium sections and necessary supporting steel framework (m.s) and brackets; all to manufacturer's specifications and details				
C	Butt joints; over 300mm wide	m2	630		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
D	Walls; vertical; internal	m2	1,222		
E	Columns; vertical; internal	m2	160		
F	Lift shaft internally	m2	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/25		
			16/26		
	TOTAL FOR FIRST FLOOR INTERNAL WALL FINISHES CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	METALWORK				
	GLASS BALUSTRADES				
	ROLLED PLATES, BARS, SECTIONS AND TUBES				
	Supply, assemble and fix 1250mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to 50mm x 12mm thick stainless steel double flat bar vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1025mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete reinforcement and at the top 3mm thick x 50mm diameter oval stainless steel handrail tube ; including all necessary cleats, stiffeners and the like; all to Architect's instructions and approval				
A	1250 mm high to detail	m	41		
B	50mm diameter x 3mm thick stainless steel tube handrail fixed to wall/column with stainless steel brackets onto 80mm long lugs at 1000mm centres; one end fish tailed and built into concrete/block work	m	41		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	25 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
C	Generally to external walls and concrete surfaces	m2	530		
	Specialist applied textured finish as 'Marmoran' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
D.	Concrete surfaces;externally	m2	530		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>CURTAIN WALLING</p> <p>Supply and fix 150 x 80 mm x 3mm thick powder coated aluminium framed curtain walling; fabricated from approved composite powder coated aluminium heavy duty hollow or angle aluminium sections of approved colour; including butt glazing with 12mm thick laminated glass with polished edges comprising of 6 mm thick reflective solar glass (approved colour) plus 1.52mm ultra-safety and security polyvinyl butyral (PVB) film plus 6mm thick self-cleaning clear glass all as manufactured by Saint Gobain – coolite series and supplied locally by Impala Glass or other equal and approved glass; glass to be butt jointed and secured to framing using approved silicon, glazing strips and beading including waterproofing all joints using approved silicon sealing compounds All fixed to aluminium framing complete with lugs for fixing framing to walls, columns or slabs</p>				
A	Curtain walling generally; diagonal sections; curved to profile	m2	180		
	<p>Extra over curtain walling for Aluminium top hung windows including all necessary ironmongery such as hinges and locking devices to Architect's approval.</p>				
B	Window size 975 x 1050 mm high	No	15		
C	Window size 890 x 1050 mm high	No	15		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/28		
			16/29		
	TOTAL FOR FIRST FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	235		
B	Ditto to receive marble tiles	m2	40		
C	Ditto to receive porcelain tiles	m2	107		
D	Ditto to receive carpet finish	m2	441		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
E	Floors; level; internal;	m2	235		
F	18 mm thick x 150mm high skirting; floor; internal	m	120		
G	25 x 15 mm solid brass decorative strip to tiled floor	m	235		
	Supply and fix polished and sealed coloured or white marble slab from an approved source laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
H	Floors; level; internal;	m2	40		
I	20 mm thick x 150mm high skirting; floor; internal	m	17		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to</p>				
A	Floors; level; internal;	m2	107		
B	18 mm thick x 150mm high skirting; floor; internal	m	749		
C	25 x 15 mm solid brass decorative strip to tiled floor	m	335		
	<p>Fitted carpet</p> <p>Supply and fix high quality heavy duty wall to wall floor carpet with dense yarn with high fade resistant with 100% solution dyed nylon suitable for heavy commercial usage yard weight minimum 1.2kg/m2 and total weight equal or above 2.5kg/m2; electrostatic propensity less than 2.0 kv ; prepare surface and lay complete with underlay as per manufacturer's printed instructions; Allow for brass knaplocks and other necessary accessories; all to approval</p>				
D	To screeded floor	m2	441		
	<p>Mahogany timber skirting</p>				
E	150 x 25mm thick moulded timber skirting	m	288		
	<p>Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-</p>				
F	Surfaces over 100mm but not exceeding 200mm girth	m	288		
	<p>Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-</p>				
G	Timber surfaces between 100-200 mm girth	m	288		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/31		
			16/32		
TOTAL FOR FIRST FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 10</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Ditto to receive marble tiles	m2	110		
	Supply and fix polished and sealed coloured or white marble slab from an approved source laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
B	Floors; level; internal;	m2	110		
C	20 mm thick x 150mm high skirting; floor; internal	m	110		
	TOTAL FOR FIRST FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYP SUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	823		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval	m	705		
	Cornices				
C	150 x 25 mm polyutherane cornice	m	278		
	ACCOUSTIC CEILING Supply and fix approved suspended semi-recessed L.I.G. fine fissured acoustic ceiling on 24mm wide white lay-in grid complete with white perimeter and curved trims and wall angles as necessary; all to Architect's details and approval. (Rate to include all necessary supports, battens and accessories)				
D	Horizontal ceiling ; internal	m2	60		
E	Extra over acoustic ceiling for forming profiled extensively bulkheads and for recessed light fitting to approval	m	65		
	INSITU FINISHES Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
F	Ceiling; horizontal; internal	m2	30		
G	Beams; horizontal; Internal	m2	280		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
A	Ceilings ; girth over 300 mm ; internal	m2	30		
B	Beams; horizontal; Internal	m2	280		
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
C	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	1,176		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes;comprising of normal PE core, aluminium panel, primer,paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
D	Butt joints; over 300mm wide	m2	250		
E	Ditto perforated for backlighting	m2	50		
	MDF laser cut out ceilings				
F	Supply and fix 18mm thick MDF laser cut out ceiling to Architect's details	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			16/35		
			16/36		
	TOTAL FOR FIRST FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling; horizontal; internal	m2	30		
B	Beams; horizontal; Internal	m2	200		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
C	Ceilings ; girth over 300 mm ; internal	m2	30		
D	Beams; horizontal; Internal	m2	200		
	ALUMINIUM COMPOSITE CEILING				
	Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes; comprising of normal PE core, aluminium panel, primer, paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details				
E	Butt joints; over 300mm wide	m2	110		
F	Ditto perforated for backlighting	m2	50		
	TOTAL FOR FIRST FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 13				
	FITTINGS				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths	m2	35		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	29		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	35		
	Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.				
E	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks	m2	10		
F	20 x 100 mm granite fascia	m	15		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Bar Cabinets</p> <p>Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison or equal and approved in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for kitchen sink all as per Architect's details</p>				
A	Bar cabinets overall size :average length 11400mm x 600mm wide x 900mm high	No	1		
	<p>Bar worktop: 600mm wide : with round edges : form holes for wash hand basin.</p>				
B	600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including adhesive : with round edges :allow to form holes for kitchen sink	m2	8		
C	20 x 100 mm granite fascia	m	12		
	<p>High level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in sides,doors, divisions and shelves; 25mm thick melanine faced MDF as before described top on 20 x50mm hardwood timber framing; including matching lipping to edges; secret nailing/screwing on prime timber substructures; complete with doors glazed with and including 6mm thick clear glass fixed with timber beading; doors on malpa hinges; with aluminium D handle and magnetic ball catches and all other necessary iron mongery</p>				
D	High level kitchen cabinet : overall size: length 7000mm x 300mm wide x 800mm high	No	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Shelving at bars</p> <p>A 6 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison or equal and approved in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	35		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/39 16/40 16/41		
	TOTAL FOR FIRST FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO.16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 15</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical, concealed fixings, building management system, audio visual, structured cabling, security, public address, solar water heating, boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR FIRST FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 16</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.16				
	FIRST FLOOR				
	<u>SECTION SUMMARY- FIRST FLOOR</u>				
1	FRAME	Page	16/4		
2	STAIRCASE AND STAIRCASE FINISHES	Page	16/9		
3	INTERNAL WALLING	Page	16/12		
4	EXTERNAL WALLING	Page	16/13		
5	DOORS AND ASSOCIATED FINISHES	Page	16/21		
6	WINDOWS AND ASSOCIATED FINISHES	Page	16/24		
7	INTERNAL WALL FINISHES	Page	16/27		
8	EXTERNAL WALL FINISHES	Page	16/30		
9	INTERNAL FLOOR FINISHES	Page	16/33		
10	EXTERNAL FLOOR FINISHES	Page	16/34		
11	INTERNAL CEILING FINISHES	Page	16/37		
12	EXTERNAL CEILING FINISHES	Page	16/38		
13	FITTINGS	Page	16/42		
14	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	16/43		
	Carried to Final Summary				
	SECTION NO.16				
	FIRST FLOOR				

SECOND FLOOR

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 16</u>				
	<u>SECOND FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 25/20mm : Vibrated				
	Beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	20		
	Gutter beams				
B	Gutter Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	33		
	Up stand beams				
C	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	30		
	Columns				
D	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	13		
	Lift shaft walls				
E	300 mm thick	m3	19		
	Suspended solid slab				
F	250 mm thick ; horizontal	m2	49		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
A	250 mm thick ; horizontal	m2	49		
	To vertical or battering sides				
B	Columns or the like; vertical and curved	m2	72		
C	Circular curved columns	m2	35		
D	Vertical sides of lift shaft walls	m2	128		
E	Edges of lift shaft walls	m	3		
F	Vertical sides and soffits of beams; curved to required radii	m2	240		
G	Vertical sides of upstand beams; horizontal;ditto	m2	250		
H	Stepped sides of moulded gutter beams;2 no steps 1no chamfer; overall 1950mm girth	m	138		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
I	Assorted sizes(T8-T25mm bars)	kg	22,974		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/1		
			16/2		
	TOTAL FOR SECOND FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p><u>ELEMENT NO 2</u></p> <p><u>EXTERNAL WALLING</u></p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar</p> <p>200 mm thick parapet walls</p>	m2	110		
	<p>TOTAL FOR SECOND FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 16</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>EXTERNAL WALL FINISHES</u>				
	METALWORK				
	GLASS BALUSTRADES				
	Supply, assemble and fix 1150mm high purpose made stainless steel (grade 3.1.6) glazed balustrading comprising of 12mm thick toughened clear structural glass fixed to and including 75mm diameter x 3mm thick stainless steel vertical support using stainless steel spider bolt anchors/ connectors. Balusters fixed to concrete floor at 1200mm centres including 200mm x 150mm x 15mm thick stainless steel base plate fixed to concrete ; including all necessary cleats, brackets,lugs stiffeners and the like; all to Architect's instructions and approval				
A	1150 mm high to detail at balconies	m	138		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	25 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	220		
B	Ditto to beams	m2	166		
	Specialist applied textured finish as 'Marmoran'' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	220		
D	To plastered beams	m2	166		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>INSITU FINISHES Screed; cement and sand (1:4) 25 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to lift walls</p> <p>Granite tile cladding</p> <p>Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	56		
B	To plastered columns	m2	56		
C	25 x 15 mm solid brass decorative strip to tiled walls	m	7		
D	<p>INSITU FINISHES Screed; cement and sand (1:4) 25 mm thick one coat backing ; wood floated to receive granite cladding (m/s)</p> <p>Generally to concrete upstands</p> <p>Granite upstand finish</p> <p>Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to</p> <p>20 mm thick; butt joints straight both ways</p>	m2	164		
E	To plastered concrete upstands	m2	164		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/5		
			16/6		
	TOTAL FOR SECOND FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 16				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 4				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	25 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granito tiles	m2	804		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
B	Floors; level; external;	m2	804		
C	18 mm thick x 150mm high skirting; floor;external	m	208		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	835		
B	Gutters	m2	166		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastick smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
C	Floors; horizontal; over 300 mm	m2	835		
D	Gutters	m2	166		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
F	210mm diameter rainwater downpipe: fixed to wall using brackets	m	40		
	Extra for:				
G	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	15		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Rainwater shoe	No	15		
B	Rainwater outlets: 210mm diameter	No	15		
C	210mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	15		
D	210mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	15		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 16/8 16/9 16/10		
	TOTAL FOR SECOND FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 16				<hr/> <hr/>

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u>				
	<p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR SECOND FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 16</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO. 16				
	SECOND FLOOR				
	<u>SECTION SUMMARY- SECOND FLOOR</u>				
1	FRAME	Page	16/3		
2	EXTERNAL WALLING	Page	16/4		
3	EXTERNAL WALL FINISHES	Page	16/7		
4	EXTERNAL FLOOR FINISHES	Page	16/11		
5	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	16/12		
Carried to Final Summary					
	SECTION NO. 16				
	SECOND FLOOR				

SUMMARY

CLUB HOUSE

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	FOR CONTRACTOR'S USE	FOR CONSULTANTS' USE
	SECTION NO. 16				
	BUILDER'S WORK SUMMARY PAGE				
	Total Brought Forward from Page No.		Page No.		
1.	GROUND FLOOR		16/50		
2.	FIRST FLOOR		16/44		
3.	SECOND FLOOR		16/13		
	Carried to Grand Summary		Ksh		
	Section No. 16 BUILDER'S WORKS SUMMARY				

GATE HOUSE

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 17</u>				
	<u>GROUND FLOOR</u>				
	<u>ELEMENT NO 1</u>				
	<u>SUBSTRUCTURES</u> <u>(All Provisional)</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	200		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	200		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	200		
	Pits ; to receive isolated bases or the like; starting from reduced level:-				
D	Not exceeding 1.5m deep	m3	26		
E	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	26		
	Foundation strips; starting from reduced level:-				
F	Not exceeding 1.5m deep	m3	90		
G	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	90		
	Extra over all kinds of excavation irrespective of depth for:-				
H	All kinds of rock	m3	42		
I	Trim and level sides and surfaces of rock	m2	20		
	DISPOSAL				
	Surplus excavated materials				
J	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	474		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Backfill material Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	200		
B	Disposal of water Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
C	Plunking and strutting Planking and strutting to sides of all excavations : keep excavations free from all fallen materials	Item	1		
D	FILLING Hardcore Supply approved hardcore on site or other equal and approved base material in making up levels. 500mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	40		
E	Stone or quarry dust Blinding surfaces of fill 50 mm thick	m2	80		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ANTI TERMITE AND HERBICIDE TREATMENT Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
A	To surfaces of blinded hardcore	m2	100		
	Damp-proof membranes				
B	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	100		
	CONCRETE WORK Insitu blinding ; mass concrete ; class 15/25mm				
C	Foundation strip	m2	60		
D	Bases	m2	18		
	Insitu ; mass concrete ; class 25/25mm				
E	Strip Footing	m3	12		
F	Bases	m3	7		
G	Columns; Vertical or sloping exceeding 15 degrees from horizontal	m3	4		
H	1500mm thick ground floor slab	m2	100		
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
I	Assorted sizes(T8-T25mm bars)	kg	4,030		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks</p> <p>In ground floor slab</p>	m2	100		
B	<p>FORMWORK TO INSITU CONCRETE</p> <p>Edges of ground floor slab</p> <p>75 to 150 mm wide</p>	m	70		
C	<p>Sides ; vertical or battering</p> <p>Columns or the like</p>	m2	50		
D	Column bases	m2	26		
E	Strip footing	m2	35		
F	<p>Foundation Walling</p> <p>Selected approved quality natural quarry stone fine hand dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks: : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to</p> <p>200mm Thick foundation walling</p>	m2	250		
G	<p>Plinth treatment</p> <p>12mm thick cement and sand (1:4) render to plinths</p>	m2	20		
H	Prepare and apply two coats of bituminous emulsion to rendered surfaces	m2	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 17				
	SUBSTRUCTURE				
	<u>SECTION SUMMARY-SUBSTRUCTURE</u>				
	Total Brought Forward from Page No.		Page No.		
			17/1		
			17/2		
			17/3		
			17/4		
	TOTAL FOR SUBSTRUCTURES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 25/20mm : Vibrated				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	9		
	Gutter beams				
B	Gutter Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	28		
C	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	5		
	Suspended solid floor slab-roof slab				
D	200mm thick ; horizontal	m2	150		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
E	200 mm thick ; horizontal	m2	150		
	To edges of suspended floor slab				
F	Girth 75 mm to 150 mm	m	100		
	To vertical or battering sides				
G	Columns or the like; vertical and curved	m2	58		
H	Vertical sides and soffits of beams	m2	90		
I	Stepped sides of moulded gutter beams;2 no steps 1no chamfer; overall 1950mm girth	m2	137		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.</p> <p>Assorted sizes(T8-T25mm bars)</p>	kg	6,610		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 17/6 17/7		
	TOTAL FOR GROUND FLOOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 3</u>				
	<u>INTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	120		
B	150mm thick walls	m2	100		
C	100mm thick walls	m2	100		
TOTAL FOR GROUND FLOOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 17					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>EXTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	378		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m2	70		
	TOTAL FOR GROUND FLOOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	Wrot mahogany or other equal and approved hardwood timber profiled to Architect's specifications as described in:				
	Door Frame				
A	200 x 50mm thick door frame; four labours; counter sunk screws	m	32		
B	Ditto transomes	m	4		
C	150 x 50mm thick door frame; four labours; counter sunk screws	m	19		
D	Ditto transomes	m	3		
	Architraves				
E	75 x 25 mm moulded	m	51		
	Quadrants				
F	25 x 25 mm	m	51		
	Beading; To fanlight				
G	25 x 25 mm	m	18		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>ALUMINIUM DOORS</p> <p>Aluminium framed doors fabricated from composite powder coated heavy duty approved standard hollow aluminium sections 100 x 50 x minimum 3 mm thick; including glazing with 4mm + 4mm thick laminated glazing; glass secured to aluminium door framing, stiles, top, middle and bottom rails using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds and including approved aluminium brackets; soft closing hinges, locks, catches, 500 mm long stainless steel pull handles, stainless steel push/pull plate, accessories, opening mechanism, sliding tracks and any other necessary ironmongery all as "ASSA ABLOY" or equal and approved ; including timber offcuts in hinge fixing points and fixing with powder coated aluminium screws; plugging or fixing on aluminium framing; sealing with mastic; oiling and adjusting on completion all to architect's details and approval.</p>				
	<p>Double leaf door; overall size 2000 mm wide x 2700 mm high</p>	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	MAHOGANY PANEL DOORS				
	50mm thick hardwood panelled door: comprised of 200 x 50mm thick stiles, top and middle rail: 200 x 50mm thick bottom rail : complete with moulded grooves to door leaf on both sides and 300mm high fanlight glazed with 6mm thick clear glass(m/s);solid blocking to iron mongery (m/s) to door				
A	Single leaf door hardwood panel door overall size 900 x 2700mm high complete with 900 x 300mm high glazed fanlight	No	5		
	FLUSH DOORS				
	Supply and fix 45mm solid core pressed MDF flush doors; mahogany veneered on facing to both sides ; Hardwood lipping on all edges : solid blocking for iron mongery (m/s) to door				
B	Single leaf door overall size 900 x 2150mm high	No	2		
	DUCT DOORS				
	45mm thick mahogany louvred door comprising of 50x3mm louvres set at 45 degrees at 50mm centres; complete with 800x300mm high solid panel at bottom solid blocking for iron mongery (m/) to door : all in accordance with Architect's details				
C	Double leaf door overall size 900 x 2150mm high	No	1		
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
D	150mm x 3.25mm heavy duty power load stainless steel bushed bearing butt hinges with matching screws	Pairs	7.5		
E	Ditto 100mmx3.25mm	Pairs	4.5		
F	32x600mm high satin stainless steel straight pull handles back to back to approval	No	20		
G	Stainless steel push plate-100x300mm	No	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	5-Lever mortice lock complete with aluminium lever handles	No	5		
B	Satin Nickel 70mm Euro restricted Double cylinder	No	5		
C	Oval satin nickel floor mounted door stop fixed with screw to approval	No	11		
A	800 x 200mm high stainless steel kick plate onto both sides to approval	No	14		
B	Satin steel Euro profile escutcheons	No	5		
C	Assa Abbloy Door closer pwr 4 with sliding rail or other equal and approved in silver finish	No	7		
D	Coat and hat hook with rubber tip in stainless steel finish	No	2		
E	Indicator lock 'Vacant / Engaged'-disabled	No	2		
F	200x300mm high stainless steel transfer grills	No	2		
	Prepare and apply one coat Dura coat aluminium wood primer as per Basco Ltd or other equal and approved on back of timber before fixing on:-				
	Wood surfaces; before fixing				
G	Door frame; girth 200 mm to 300 mm	m	32		
H	Door frame; girth 100 mm to 200 mm	m	19		
I	Architraves girth not exceeding 100 mm	m	51		
J	Quadrants/Beading girth not exceeding 100 mm	m	51		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply Three coats Dura coat polyurethane wood seal as per Basco Ltd or other equal and approved				
	Wood surfaces				
A	Door frame; girth 200 mm to 300 mm	m	58		
B	Architraves girth 100 mm to 200mm	m	51		
C	Quadrants/beading girth not exceeding 100 mm	m	69		
D	General surfaces of wood	m2	34		
	<u>GLAZING</u>				
	Supply and fix 6mm thick clear glass fanlight fixed to timber with glazing beads (m.s) as described:-				
E	In panes not exceeding 0.50 square meters	m2	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 17/11 17/12 17/13 17/14 17/15		
	TOTAL FOR GROUND FLOOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Supply and fix 100 x 50 x 3 mm (minimum)thick powder coated top - hung openable aluminium framed windows, to be supplied and fixed by an approved domestic subcontractor, to be fabricated from approved composite extruded powder coated heavy duty hollow or angle sections (minimum 3 mm thick); including glazing with 4mm+4mm thick laminated glass secured to framing using approved rubber glazing strips , aluminium beading and silicone sealant where necessary; complete with 400 mm wide powder coated aluminium louvres including sandwiched plastic insect gauze; frames and framing all round mitred at corners including reinforcing cleats, fixing with aluminium screws; plugging and fixing to jambs; sealing with mastic; oiling and adjusting on completion and all necessary ironmongery such as hinges, locking devices such as windows fasteners, stays locks, bolts, sliding tracks etc to Architect's approval and in accordance with Architectural drawing				
A	Window overall size 2300 x 2000 mm high	No	7		
B	Window overall size 1000 x 1000 mm high	No	5		
	WINDOW BOARDS				
	Wrot prime grade mahogany timber, well seasoned and pressure impregnated with approved preservative as described in:-				
D	250 x 25mm Window board	m	24		
E	20 x 25mm Quadrant beading	m	24		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Prepare and apply one coat aluminium wood primer to back of frames before fixing to:-				
A	Back of wood frames over 200mm but not exceeding 300mm girth	m	24		
B	Ditto: 0-100 mm girth	m	24		
	Prepare, knot, prime, stop and apply primer and two coats of premium polyutherane clear lacquer varnish to wood work as described:-				
C	Timber surfaces between 200-300mm girth	m	24		
D	Ditto: 0-100 mm girth	m	24		
	WINDOW BLINDS				
E	25mm x 0.25mm thick vertical venetian aluminium retractable blinds; comprising of black out/translucent heavy fire retardant fabrics complete with rings,rollers brass l section rails and all other necessary accessories	m2	20		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces bedded and jointed cement and sand (1:3) mortar				
F	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	24		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WINDOWS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 17/17		
			17/18		
	TOTAL FOR GROUND FLOOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	882		
B	Ditto columns; vertical; internally	m2	57		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally				
C	Walls; vertical; internal	m2	136		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 600 x 300mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
D	Walls; vertical; internal	m2	136		
E	Extra over for 100 mm wide decorative tile to approval	m	34		
F	Aluminium edging strip to corners of granito tiled walls	m	28		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
A	Walls; vertical; internal	m2	882		
B	Columns; vertical; internal	m2	57		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL WALL FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			17/20		
			17/21		
	TOTAL FOR GROUND FLOOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 8				
	EXTERNAL WALL FINISHES				
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	378		
B	Ditto to beams	m2	32		
	Specialist applied textured finish as 'Marmoran' supplied by Galaxy Paints Ltd; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	378		
D	To plastered beams	m2	32		
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive granite cladding (m/s)				
E	Generally to columns	m2	30		
	Granite column finish				
	Supply and fix polished local coloured granite from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints straight both ways				
F	To plastered columns	m2	30		
G	25 x 15 mm solid brass decorative strip to tiled walls	m	20		
	TOTAL FOR GROUND FLOOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; internal; receive granito tiles	m2	20		
B	Ditto to receive porcelain tiles	m2	50		
	Supply and fix 600 x 600mm full body vitrified non-slip granito tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
C	Floors; level; internal;	m2	20		
D	18 mm thick x 150mm high skirting; floor; internal	m	42		
E	25 x 15 mm solid brass decorative strip to tiled floor	m	10		
	Supply and fix 600 x 600mm full body "European Type" porcelain tiles from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	18 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
F	Floors; level; internal;	m2	50		
G	18 mm thick x 150mm high skirting; floor; internal	m	51		
H	25 x 15 mm solid brass decorative strip to tiled floor	m	15		
	TOTAL FOR GROUND FLOOR -INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 9				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
A	Floors; horizontal; external; receive granite tiles	m2	10		
	Supply and fix polished local coloured granite slab from an approved source; laid in approved pattern; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	20 mm thick; butt joints strait both ways; to cement and sand base (m/s); generally to				
F	Floors; level; external;	m2	10		
G	20 mm thick x 150mm high skirting; floor; external	m	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED AREAS				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Floors; horizontal; over 300mm wide	m2	150		
B	Gutters	m2	121		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
C	Floors; horizontal; over 300 mm	m2	150		
D	Gutters	m2	121		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
F	Floors; horizontal; external; receive precast concrete interlocking tiles	m2	205		
	200 x 200 x 12mm Thick precast interlocking concrete tiles laid on cement and sand screed (m.s) as described on				
G	Floors; level; external;	m2	150		
H	12mm thick x 150mm high skirting; floor;external	m	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
A	150mm diameter rainwater downpipe: fixed to wall using brackets	m	20		
	Extra for:				
B	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	5		
C	Rainwater shoe	No	5		
D	Rainwater outlets: 210mm diameter	No	5		
E	150mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	5		
F	150mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	5		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT		
	EXTERNAL FLOOR FINISHES COLLECTION PAGE						
	Total Brought Forward from Page No.		Page No. 17/25 17/26 17/27				
TOTAL FOR GROUND FLOOR -EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17					<table border="1"> <tr> <td> </td> </tr> <tr> <td> </td> </tr> </table>		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 10</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	GYPSUM PLASTERBOARD 12mm Thick gypsum plasterboard fixed with screws to galvanised light weight steel frame work suspended from concrete above with mild steel angle sections , perimeter channels, primary support channels , strap hangers connecting clips etc with joints skimmed with gypsum plaster including forming and curved cuttings				
A	Horizontal ceiling ; internal	m2	50		
B	Extra over gypsum ceiling for forming profiled extensively 500mm high bulkheads for recessed light fitting to approval; in oval,circular,square and rectangular shape etc	m	10		
C	Cornices 150 x 25 mm polyurethane cornice	m	52		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	One undercoat ; two coats matt emulsion paint ; to Crown or equal and approved				
	To steel trowelled plastered surfaces				
D	Plasterboard ; including for Altek filler compound to joints, skimming etc ;girth over 300 mm ; internal	m2	55		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ALUMINIUM COMPOSITE CEILING				
	<p>Supply and fix 6mm thick nano self cleansing perforated aluminium composite ceiling sheets in panes sizes ranging from 300 x 300 mm - 600 x 600 mm; cutting to sizes; comprising of normal PE core, aluminium panel, primer, paint, PVDF paint and finished in nanometer paint all as Alucobond or other equal and approved ; with matching trim and associated accessories ; fixed to and including aluminium sections and brackets with approved silicon sealant; all to manufacturer's specifications and details</p>				
A	Butt joints; over 300mm wide	m2	20		
B	Ditto perforated for backlighting	m2	5		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	INTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 17/29 17/30		
	TOTAL FOR GROUND FLOOR -INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>EXTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal;external	m2	20		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
B	Ceilings ; girth over 300 mm ; external	m2	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL CEILING FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 17/32		
	TOTAL FOR GROUND FLOOR -EXTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	100mm thick plinths of kitchen and stores	m2	2		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	5		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	2		
	Concrete worktops				
D	100mm thick reinforced concrete worktop : 600mm wide : including 100mm thick division walls at every 1000mm centres; complete with plasterwork to worktop and wall; including reinforcement and necessary formwork	m	5		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Vanity Cabinets</p> <p>Low level cabinets: comprising of 25mm thick melanine faced MDF as "Melawood Supagloss" from PG Bison in internal shelvings, doors, sides and partitions; including 20 x 50mm hardwood timber runners ; including matching lipping to edges; secret nailing/screwing on prime timber substructures; All exposed surfaces in melanine faced MDF as before described; complete with drawers in 25mm thick melanine faced MDF as before described ; complete with doors in 25mm thick melanine faced MDF as before described; including malpa hinges, aluminium D handle, magnetic ball catches and all other necessary ironmongery. Including making hole for sinks all as per Architect's details</p>				
B	<p>Vanity cabinets overall size :average length 1200mm x 600mm wide x 900mm high</p> <p>Vanity worktop: 600mm wide : with round edges : form holes for wash hand basin.</p>	No	2		
C	<p>600mm wide x 20mm thick crystal blue granite top as before described; fixed with and including approved adhesive : with round edges :allow to form holes for sinks</p>	m2	3		
D	<p>20 x 100 mm granite fascia</p> <p>Shelving at stores</p>	m	5		
B	<p>5 tier open shelves comprising 600mm wide x 20mm thick melanine faced MDF as "Melawood supagloss" from PG Bison in shelving ; with matching lipping: complete with sides and divisions; secret nailing/screwing ; on and including mild steel brackets</p>	m	10		
	<p>Carried to Collection</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FITTINGS COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 17/34 17/35		
	TOTAL FOR GROUND FLOOR -FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 17				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 13</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical,concealed fixings,building management system, audio visual,structured cabling, security, public address,solar water heating,boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR GROUND FLOOR -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 17</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 17				
	GROUND FLOOR				
	<u>SECTION SUMMARY- GROUND FLOOR</u>				
1	SUB-STRUCTURE	Page	17/5		
2	FRAME	Page	17/8		
4	INTERNAL WALLING	Page	17/9		
5	EXTERNAL WALLING	Page	17/10		
6	DOORS AND ASSOCIATED FINISHES	Page	17/16		
7	WINDOWS AND ASSOCIATED FINISHES	Page	17/19		
8	INTERNAL WALL FINISHES	Page	17/22		
9	EXTERNAL WALL FINISHES	Page	17/23		
10	INTERNAL FLOOR FINISHES	Page	17/24		
11	EXTERNAL FLOOR FINISHES	Page	17/28		
12	INTERNAL CEILING FINISHES	Page	17/31		
13	EXTERNAL CEILING FINISHES	Page	17/33		
14	FITTINGS	Page	17/36		
16	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	17/37		
	SUB-TOTAL AMOUNT FOR ONE GATE HOUSE				
	NO				
	Carried to Grand Summary				
	Section No. 17 GROUND FLOOR				

SERVICE BUILDING

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 18</u>				
	<u>SERVICE BUILDING</u>				
	<u>ELEMENT NO 1</u>				
	<u>SUBSTRUCTURES</u> <u>(All Provisional)</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	327		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	327		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	175		
	Pits ; to receive isolated bases or the like; starting from reduced level:-				
D	Not exceeding 1.5m deep	m3	6		
	Foundation strips; starting from reduced level:-				
E	Not exceeding 1.5m deep	m3	17		
	Extra over all kinds of excavation irrespective of depth for:-				
F	All kinds of rock	m3	6		
G	Trim and level sides and surfaces of rock	m2	426		
	DISPOSAL AND BACKFILLING				
	Surplus excavated materials				
H	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	205		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Backfill material				
A	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	25		
B	Return, fill and ram selected excavated materials in layers maximum 150 mm thick	m3	25		
	Disposal of water				
C	Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
	Plunking and strutting				
D	Planking and strutting to sides of all excavations : keep excavations free from all fallen materials	Item	1		
	FILLING				
	Hardcore				
	Supply approved hardcore on site or other equal and approved base material in making up levels.				
E	500mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	190		
	Stone or quarry dust				
	Blinding surfaces of fill				
F	50 mm thick	m2	380		
	ANTI TERMITE AND HERBICIDE TREATMENT				
	Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
G	To surfaces of blinded hardcore	m2	380		
	Damp-proof membranes				
H	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	380		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	CONCRETE WORK				
	Insitu blinding ; mass concrete ; class 15/25mm				
A	Foundation strip	m2	71		
B	Bases	m2	13		
	Insitu ; mass concrete ; class 25/25mm				
C	Strip Footing	m3	14		
D	Bases	m3	6		
E	Columns; Vertical or sloping exceeding 15 degrees from horizontal	m3	1		
F	150mm thick slab	m2	335		
	Ramp 1:12				
G	150 mm thick	m2	45		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
H	Assorted sizes(T8-T25mm bars)	kg	1,130		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
I	In slab	m2	380		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Edges of slab				
A	75 to 150 mm wide	m	126		
	Sides ; vertical or battering				
B	Columns or the like; vertical and curved	m2	8		
C	Column bases	m2	19		
D	Strip footing	m2	45		
	Foundation Walling				
	Selected approved quality natural quarry stone fine hand dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks : : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to				
E	200mm Thick foundation walling	m2	57		
	Plinth treatment				
F	12mm thick cement and sand (1:4) render to plinths	m2	50		
G	Prepare and apply two coats of bituminous emulsion to rendered surfaces	m2	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 18				
	SUBSTRUCTURE				
	<u>SECTION SUMMARY-SUBSTRUCTURE</u>				
			Page No.		
	Total Brought Forward from Page No.		18/1		
			18/2		
			18/3		
			18/4		
	TOTAL FOR SUBSTRUCTURES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 25/20mm : Vibrated				
	Beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	16		
	Columns				
B	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	3		
	Suspended solid slab-roof slab				
C	200 mm thick ; horizontal	m2	350		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
D	200 mm thick ; horizontal	m2	335		
	To edges of suspended roof slab				
E	Girth 150 mm to 225 mm	m	76		
	To edges of ramp				
F	Girth 150 mm to 225 mm	m	42		
	To vertical or battering sides				
G	Columns or the like; vertical and curved	m2	38		
H	Vertical sides and soffits of beams; horizontal or curved to required radii	m2	143		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers. Assorted sizes(T8-T25mm bars)</p>	kg	11,258		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FRAME COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			18/6		
			18/7		
	TOTAL FOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 3</u></p> <p><u>INTERNAL WALLING</u></p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar</p>				
A	200 mm thick walls	m2	133		
	<p>TOTAL FOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 18</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>EXTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	266		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m2	266		
	TOTAL FOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>DOORS AND ASSOCIATED FINISHES</u>				
	MILD STEEL DOORS				
	<p>Mild steel louvre door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth</p>				
A	Double leaf door overall size 2000 mm wide x 2700 mm high	No	9		
B	Ditto but to single leaf door overall size 1000mm wide x 2700mm high	No	2		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
A	Oval satin nickel floor mounted door stop fixed with screw to approval	No	10		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
B	Over 300 mm ; Internally	m2	54		
C	Over 300 mm ; externally	m2	65		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			18/11		
			18/12		
	TOTAL FOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 6				
	WINDOWS AND ASSOCIATED FINISHES				
	PURPOSE MADE UNITS				
	Mild steel louvre window comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; including priming door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Window overall size 2000 x 2000 mm high	No	10		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
B	Over 300 mm ; Internally and externally	m2	80		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces				
C	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	24		
	TOTAL FOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	521		
B	Beams; vertical; internal	m2	74		
C	Ditto columns; vertical; internally	m2	38		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
D	Walls; vertical; internal	m2	521		
E	Beams; vertical; internal	m2	74		
F	Columns; vertical; internal	m2	38		
TOTAL FOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 8</u>				
	<u>EXTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	266		
B	Ditto to beams	m2	34		
	Specialist applied textured finish as 'Marmoran" supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	266		
D	To plastered beams	m2	34		
	TOTAL FOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4) 25 mm thick one coat beds; wood floated; to concrete; generally to receive terrazzo paving;				
A	Floors; horizontal; internal	m2	261		
B	25mm thick finish in two layers to 450 x 450mm cable trench in base slab; steel trowelled smooth	m2	15		
	Plaster				
C	12mm thick sand cement lime plaster in two coats; steel trowelled finish; to channel side walls	m2	15		
	PAVINGS				
	25mm thick insitu polished terrazzo laid on concrete in approved coloured aggregate finished smooth including sanding as described in:				
D	Floors; internal;	m2	291		
E	Ditto to 150mm high skirting; floor; internal	m	147		
	Dividing Strips (provisional)				
F	25 x 3 mm plastic dividing strips; set in screed	m	47		
	TOTAL FOR INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 10</u>				
	<u>EXTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete; generally to receive terrazzo paving;				
A	Ramp; horizontal; external	m2	45		
	PAVINGS				
	25mm thick insitu polished terrazzo laid on concrete in approved coloured aggregate finished smooth including sanding as described in:				
B	Ramp; external;	m2	45		
	Dividing Strips (provisional)				
C	25 x 3 mm plastic dividing strips; set in screed	m	16		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	WATERPROOFING TO EXPOSED ROOF SLAB				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Roof slab; horizontal; over 300mm wide	m2	330		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Roof slab; horizontal; over 300mm wide	m2	330		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	150mm diameter rainwater downpipe: fixed to wall using brackets	m	28		
	Extra for:				
E	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	6		
F	Rainwater shoe	No	6		
G	Rainwater outlets: 210mm diameter	No	6		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Service Building

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	150mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	6		
B	150mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	6		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			18/18		
			18/19		
			18/20		
	TOTAL FOR EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal; internal	m2	261		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
B	Ceilings ; girth over 300 mm ; internal	m2	261		
	TOTAL FOR INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 18				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	200mm thick plinths	m2	16		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	24		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	16		
	Open 'U' drainage				
D	300mm wide(internal) open 'U' drain comprising of 700mm wide x 150mm thick concrete base on and including 50mm thick concrete blinding; 500mm high x 200mm thick insitu class 20 concrete walls average 450mm high; including internal plaster, reinforcement and formwork	m	34		
	Mild steel grating				
E	400mm wide mild steel channel grating : comprising 40 x 40 x 6mm edge frame : infilled with 40 x 6mm flats at 50mm centres : 40 x 40 x 6mm frame set in concrete with 150mm long mild steel end split lugs : smooth weld joints; red oxide primer: two coats gloss paint finish :	m	34		
TOTAL FOR SERVICE BUILDING FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION NO. 18					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 13</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical, concealed fixings, building management system, audio visual, structured cabling, security, public address, solar water heating, boiler installations etc</p> <p>A Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR SERVICE BUILDING -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION NO. 18</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
Section No. 18					
SERVICE BUILDING					
<u>SECTION SUMMARY- SERVICE BUILDING</u>					
1	SUB-STRUCTURE	Page	18/5		
2	FRAME	Page	18/8		
4	INTERNAL WALLING	Page	18/9		
5	EXTERNAL WALLING	Page	18/10		
8	DOORS AND ASSOCIATED FINISHES	Page	18/13		
9	WINDOWS AND ASSOCIATED FINISHES	Page	18/14		
10	INTERNAL WALL FINISHES	Page	18/15		
11	EXTERNAL WALL FINISHES	Page	18/16		
12	INTERNAL FLOOR FINISHES	Page	18/17		
13	EXTERNAL FLOOR FINISHES	Page	18/21		
14	INTERNAL CEILING FINISHES	Page	18/22		
15	FITTINGS	Page	18/23		
16	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	18/24		
Carried to Grand Summary					
Section No. 18					
SERVICE BUILDING					

BOILER HOUSE

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 19				
	BOILER HOUSE				
	ELEMENT NO 1				
	SUBSTRUCTURES (All Provisional)				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	194		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	194		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	192		
	Pits ; to receive isolated bases or the like; starting from reduced level:-				
D	Not exceeding 1.5m deep	m3	8		
	Foundation strips; starting from reduced level:-				
E	Not exceeding 1.5m deep	m3	8		
	Extra over all kinds of excavation irrespective of depth for:-				
F	All kinds of rock	m3	121		
G	Trim and level sides and surfaces of rock	m2	298		
	DISPOSAL AND BACKFILLING				
	Surplus excavated materials				
H	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	328		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Backfill material				
A	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	160		
B	Return, fill and ram selected excavated materials in layers maximum 150 mm thick	m3	160		
	Disposal of water				
C	Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
	Plunking and strutting				
D	Planking and strutting to sides of all excavations : keep excavations free from all fallen materials	Item	1		
	FILLING				
	Hardcore				
	Supply approved hardcore on site or other equal and approved base material in making up levels.				
E	500mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	75		
	Stone or quarry dust				
	Blinding surfaces of fill				
F	50 mm thick	m2	151		
	ANTI TERMITE AND HERBICIDE TREATMENT				
	Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
G	To surfaces of blinded hardcore	m2	151		
	Damp-proof membranes				
H	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	151		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	CONCRETE WORK				
	Insitu blinding ; mass concrete ; class 25/25mm				
A	Foundation strip	m2	40		
B	Bases	m2	16		
	Insitu ; mass concrete ; class 25/25mm				
C	Strip Footing	m3	8		
D	Bases	m3	7		
E	Columns; Vertical or sloping exceeding 15 degrees from horizontal	m3	1		
F	150mm thick slab	m2	151		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
G	Assorted sizes(T8-T25mm bars)	kg	1,018		
	Fabric; B.S. 4483 Reference A142; mesh 200 x 200 mm weight 2.22 kgs per square meter (measured net - no allowance made for laps); including bends, tying wire and distance blocks				
H	In ground floor slab	m2	151		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FORMWORK TO INSITU CONCRETE				
	Edges of slab				
A	150 to 225 mm wide	m	54		
	Sides ; vertical or battering				
B	Columns or the like; vertical and curved	m2	18		
C	Column bases	m2	24		
D	Strip footing	m2	26		
	Foundation Walling				
	Selected approved quality natural quarry stone fine hand dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks: : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to				
E	200mm Thick foundation walling	m2	103		
	Plinth treatment				
F	12mm thick cement and sand (1:4) render to plinths	m2	50		
G	Prepare and apply two coats of bituminous emulsion to rendered surfaces	m2	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 19				
	SUBSTRUCTURE				
	<u>SECTION SUMMARY-SUBSTRUCTURE</u>				
			Page No.		
	Total Brought Forward from Page No.		19/1		
			19/2		
			19/3		
			19/4		
	TOTAL FOR SUBSTRUCTURES CARRIED FORWARD TO SUMMARY OF SECTION NO. 19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 25/20mm : Vibrated				
	Beams				
A	Beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	5		
	Columns				
B	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	3		
	Suspended solid slab-roof slab				
C	200 mm thick ; horizontal	m2	160		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	Soffits of solid floors				
D	150 mm thick ; horizontal	m2	158		
	To edges of suspended roof slab				
E	Girth 150 mm to 225 mm	m	54		
	To vertical or battering sides				
F	Columns or the like; vertical and curved	m2	47		
	Vertical sides and soffits of beams; horizontal or curved to required radii				
G		m2	84		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
H	Assorted sizes(T8-T25mm bars)	kg	4,055		
	TOTAL FOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 3</u></p> <p><u>INTERNAL WALLING</u></p> <p>BLOCKWORK Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar</p>				
A	200 mm thick walls	m2	50		
	<p>TOTAL FOR INTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO.19</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>EXTERNAL WALLING</u>				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	189		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m2	189		
	TOTAL FOR EXTERNAL WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 5</u></p> <p><u>DOORS AND ASSOCIATED FINISHES</u></p> <p>MILD STEEL DOORS</p> <p>Mild steel louvre door comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; Each door leaf supplied complete with 2 pairs heavy duty 150 mm pressed steel butt hinges welded to door leaf and door framing 2 No 16 mm diameter once kneed barrel bolts 250 mm long; with 50 mm diameter curved steel tube pull handles; 2 No oanel lock with steel padlock hasps; including priming door leaf and door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth</p>				
A	Double leaf door overall size 5400 mm wide x 2700 mm high	No	3		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	IRONMONGERY				
	Supply and fix the following ironmongery selected from "Union" catalogue issued by "ASSA ABLOY" complete with matching screws:-				
A	Oval satin nickel floor mounted door stop fixed with screw to approval	No	3		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
B	Over 300 mm ; Internally	m2	44		
C	Over 300 mm ; externally	m2	44		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	DOORS AND ASSOCIATED FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 19/9 19/10		
	TOTAL FOR DOORS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>WINDOWS AND ASSOCIATED FINISHES</u>				
	PURPOSE MADE UNITS				
	Mild steel louvre window comprising of 100 x 50 x 4 mm thick pressed frame fixed to wall with and including building frame into block wall; each openable leaf comprising of 100 x 50 x 4 mm thick pressed steel stiles and middle rails and 100 x 50 x 4 mm thick top & bottom rails (frames and stiles in rolled hollow sections) faced both sides with 3 mm thick mild steel plate infill panel spot welded to mild steel stiles and rails; complete with 50 x 3mm thick louvres set at 45 degrees at 50 mm centres welded to stiles; with 25 x 4 mm thick mild steel flats welded to edges of the door leaf in filled with approved mosquito gauze spot welded to sub frame. Complete with fixing lugs; including priming door frame with grey primer before delivery to site and all necessary welding and grinding welds smooth				
A	Window overall size 5400 x 2000 mm high	No	3		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
B	Metal surfaces between 200 - 30mm girth	m2	89		
	WINDOW CILL				
	Precast concrete class 20 fair faced all exposed surfaces				
C	250 x 25mm thick precast concrete once rebated and throated window cill laid and jointed in cement and sand 1:3 mortar	m	17		
	TOTAL FOR WINDOWS AND ASSOCIATED FINISHES CARRIED FORWARD TO SUMMARY OF Section No. 19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 7</u>				
	<u>INTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel floated hard and smooth				
A	12 mm thick (minimum) 2 No. coat work generally to walls; vertical; internally	m2	267		
B	Beams; vertical; internal	m2	56		
C	Ditto columns; vertical; internally	m2	12		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	Steel trowelled plastered surfaces of wall; internally				
D	Walls; vertical; internal	m2	267		
E	Beams; vertical; internal	m2	56		
F	Columns; vertical; internal	m2	12		
	TOTAL FOR INTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 8</u>				
	<u>EXTERNAL WALL FINISHES</u>				
	INSITU FINISHES				
	Screed; cement and sand (1:4) 20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls	m2	189		
B	Ditto to beams	m2	24		
	Specialist applied textured finish as 'Marmoran" supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls	m2	189		
D	To plastered beams	m2	24		
	TOTAL FOR EXTERNAL WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 9</u>				
	<u>INTERNAL FLOOR FINISHES</u>				
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4) 25 mm thick one coat beds; wood floated; to concrete; generally to receive terrazzo paving;				
A	Floors; horizontal; internal	m2	146		
B	25mm thick finish in two layers to 450 x 450mm cable trench in base slab; steel trowelled smooth	m2	15		
	Plaster				
C	12mm thick sand cement lime plaster in two coats; steel trowelled finish; to channel side walls	m2	15		
	PAVINGS				
	25mm thick insitu polished terrazzo laid on concrete in approved coloured aggregate finished smooth including sanding as described in:				
D	Floors; internal;	m2	177		
E	Ditto to 100mm high skirting; floor; internal	m	267		
	Dividing Strips (provisional)				
F	25 x 3 mm plastic dividing strips; set in screed	m	35		
	TOTAL FOR INTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION .19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 10				
	EXTERNAL FLOOR FINISHES				
	BEDS OR BACKINGS				
	WATERPROOFING TO EXPOSED ROOF SLAB				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
A	Roof slab; horizontal; over 300mm wide	m2	146		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastick smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
B	Roof slab; horizontal; over 300mm wide	m2	146		
C	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	RAINWATER DISPOSAL				
	Unplasticized PVC downpipes and fittings: solvent welded joints				
D	150mm diameter rainwater downpipe: fixed to wall using brackets	m	28		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Extra for:				
A	Bend : including socket adaptor from gutter outlet to downpipes; complete	No	6		
B	Rainwater shoe	No	6		
C	Rainwater outlets: 210mm diameter	No	6		
D	150mm diameter fulbora roof outlet : with domical gratings : vertical spigots	No	6		
E	150mm diameter x 200mm long UPVC pipe sleeve ; casting into concrete slab	No	6		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	EXTERNAL FLOOR FINISHES COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No.		
			19/16		
			19/17		
	TOTAL FOR EXTERNAL FLOOR FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 11</u>				
	<u>INTERNAL CEILING FINISHES</u>				
	INSITU FINISHES				
	Plaster; 9 mm (minimum) first coat of cement and sand (1:4); 3 mm second coat of cement and lime putty (1:5) steel trowelled hard and smooth				
A	Ceiling and soffits of beams; horizontal; internal	m2	146		
	PAINTING AND DECORATING				
	One coat CROWN 'solo' or other equal and approved undercoat including skimming surfaces to smoothen them using approved filler and sanding to smooth surface; approved colour; two coats CROWN 'solo' or other equal and approved pure satin emulsion; approved colour; applied in accordance with manufacturer's printed instruction				
	To steel trowelled plastered surfaces				
B	Ceilings ; girth over 300 mm ; internal	m2	146		
	TOTAL FOR INTERNAL CEILING FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO.19				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 12</u>				
	<u>FITTINGS</u>				
	Plain insitu concrete: class 15/20mm				
A	200mm thick plinths	m2	48		
	Sawn formwork to:				
B	Vertical edges: over 75mm but not exceeding 150mm high	m	28		
	Cement and sand(1:4) paving : steel trowelled to				
C	20mm thick to plinths	m2	48		
	Open 'U' drainage				
D	300mm wide(internal) open 'U' drain comprising of 700mm wide x 150mm thick concrete base on and including 50mm thick concrete blinding; 500mm high x 200mm thick insitu class 20 concrete walls average 450mm high; including internal plaster, reinforcement and formwork	m	10		
	Mild steel grating				
E	400mm wide mild steel channel grating : comprising 40 x 40 x 6mm edge frame : infilled with 40 x 6mm flats at 50mm centres : 40 x 40 x 6mm frame set in concrete with 150mm long mild steel end split lugs : smooth weld joints; red oxide primer: two coats gloss paint finish :	m	10		
TOTAL FOR SERVICE BUILDING FITTINGS CARRIED FORWARD TO SUMMARY OF SECTION.19					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p><u>ELEMENT NO 13</u></p> <p><u>BUILDER'S WORK IN CONNECTION WITH SERVICES</u></p> <p>Builder's work incidental to sanitary fittings, ventilation, plumbing, drainage, reticulation, fire fighting, electrical, concealed fixings, building management system, audio visual, structured cabling, security, public address, solar water heating, boiler installations etc</p>				
A	<p>Allow for making holes, chasing walls, floors, inclusion of sleeves and other items necessary for the proper carrying out of the installations including all builder's work of making good all surfaces</p>	Item	1		
	<p>TOTAL FOR SERVICE BUILDING -BWICWS CARRIED FORWARD TO SUMMARY OF SECTION .19</p>				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.19				
	BOILER ROOM				
	<u>SECTION SUMMARY- BOILER ROOM</u>				
1	SUB-STRUCTURE	Page	19/5		
2	FRAME	Page	19/6		
3	INTERNAL WALLING	Page	19/7		
4	EXTERNAL WALLING	Page	19/8		
5	DOORS AND ASSOCIATED FINISHES	Page	19/11		
6	WINDOWS AND ASSOCIATED FINISHES	Page	19/12		
7	INTERNAL WALL FINISHES	Page	19/13		
8	EXTERNAL WALL FINISHES	Page	19/14		
9	INTERNAL FLOOR FINISHES	Page	19/15		
10	EXTERNAL FLOOR FINISHES	Page	19/18		
11	INTERNAL CEILING FINISHES	Page	19/19		
12	FITTINGS	Page	19/20		
13	BUILDER'S WORK IN CONNECTION WITH SERVICES	Page	19/21		
	Carried to Grand Summary				
	Section No. 19 SERVICE BUILDING				

BOUNDARY WALL

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION NO. 20</u>				
	<u>BOUNDARY WALL AND GATES</u>				
	<u>ELEMENT NO 1</u>				
	<u>SUBSTRUCTURES</u> <u>(All Provisional)</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	568		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	568		
	Pits ; to receive isolated bases or the like; starting from reduced level:-				
D	Not exceeding 1.5m deep	m3	642		
E	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	642		
	Foundation strips; starting from reduced level:-				
F	Not exceeding 1.5m deep	m3	434		
G	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	434		
	Extra over all kinds of excavation irrespective of depth for:-				
H	All kinds of rock	m3	164		
I	Trim and level sides and surfaces of rock	m2	50		
	DISPOSAL				
	Surplus excavated materials				
J	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	2,316		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Backfill material Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	2,316		
B	Disposal of water Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
C	Plunking and strutting Planking and strutting to sides of all excavations : keep excavations free from all fallen materials	Item	1		
CONCRETE WORK					
Insitu blinding ; mass concrete ; class 15/25mm					
D	Foundation strip	m2	290		
E	Bases	m2	428		
Insitu ; mass concrete ; class 25/25mm					
F	Strip Footing	m3	58		
G	Bases	m3	214		
H	Columns; Vertical	m3	116		
REINFORCEMENT (PROVISIONAL)					
T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.					
I	Assorted sizes(T8-T25mm bars)	kg	35,280		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sides ; vertical or battering Columns or the like	m2	1,026		
B	Column bases	m2	570		
C	Strip footing	m2	193		
	Foundation Walling Selected approved quality natural quarry stone fine hand dressed and cut to regular block size: stone load bearing blocks (7N/mm?) : including double dressing to corner blocks: : 20 gauge x 25mm wide hoop iron in every alternate course : with 20 Gauge hoop iron reinforcement and column-wall ties : one end cast into concrete : other end built into walling in alternate courses: to				
D	200mm Thick foundation walling	m2	1446		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 20				
	SUBSTRUCTURE				
	<u>SECTION SUMMARY-SUBSTRUCTURE</u>				
	Total Brought Forward from Page No.		Page No. 20/1		
			20/2		
			20/3		
	TOTAL FOR SUBSTRUCTURES CARRIED FORWARD TO SUMMARY OF SECTION NO. 20				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 2</u>				
	<u>FRAME</u>				
	INSITU CONCRETE : REINFORCED Normal; class 25/20mm : Vibrated				
A	Ground beams; horizontal or sloping not exceeding 15 degrees from horizontal	m3	44		
B	Columns; vertical or sloping exceeding 15 degrees from horizontal	m3	52		
	FORMWORK TO INSITU CONCRETE				
	Formwork generally				
	To vertical or battering sides				
C	Columns or the like; vertical and curved	m2	1,026		
D	Vertical sides and soffits of beams	m2	434		
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
E	Assorted sizes(T8-T25mm bars)	kg	14,400		
TOTAL FOR FRAME CARRIED FORWARD TO SUMMARY OF SECTION NO. 20					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO 3				
	WALLING				
	BLOCKWORK				
	Machine cut natural stone or hollow concrete block walling ; load bearing 7.0 N/mm2: reinforced with 20 gauge 25mm hoop iron strips laid horizontally every alternate course: bedded and jointed in cement and sand (1:3) mortar				
A	200 mm thick walls	m2	1,446		
	Hessian based bituminous felt damp proofing course laid on cement and sand (1:4) mortar				
B	200mm wide	m2	482		
	EXPANSION JOINTS				
C	30mm Thick "Jumbolene expansion joint filler" or other equal and approved expansion material	m2	257		
D	30 mm x 30 mm deep " NITOSEAL MS 100 " or other equal and approved expansion joint sealer in joint with 60 x 60 x 4 mm angle lugs	m	1,140		
TOTAL FOR WALLING CARRIED FORWARD TO SUMMARY OF SECTION NO. 20					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 4</u>				
	<u>WALL FINISHES</u>				
	INSITU FINISHES				
	Screed; cement and sand (1:4)				
	20 mm thick one coat backing ; wood floated to receive textured paint (m/s)				
A	Generally to external walls and beams	m2	3,326		
B	Generally to columns	m2	1,026		
	Specialist applied textured finish as 'Marmoran' supplied by Galaxy Paints Ltd or other equal and approved; 3mm thick (minimum) finish including primer coat before application; applied with a trowel or roller as per manufacturer's recommendation : All to Architect's approval				
C	To plastered external walls and beams	m2	3,326		
D	Ditto to columns	m2	1,026		
	Precast concrete class 20 (12mm,aggregate) including formwork, finishing fair face on all exposed surfaces, and bedding and jointing in cement and sand (1:3) mortar				
E	250x45mm thick copings; once weathered and throated	m	482		
F	600 X 600 X 50mm thick column caping piece	No	190		
	Decorative mouldings				
G	Allow for concrete decorative ring mouldings on columns to architect's approval	No	190		
	TOTAL FOR WALL FINISHES CARRIED FORWARD TO SUMMARY OF SECTION NO. 20				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 5</u>				
	<u>SHS FENCING GRILLES</u>				
	Supply and fix mild steel grille fencing comprising of 50 x 50 x 3mm SHS main members running vertically at 200mm c/c fixed to masonry wall(m/s), welded to 25 x 25 x 3mm SHS members running horizontally at 200mm c/c; complete with 9mm thick welded steel plates at 50 x 50x 3mm SHS members; complete with 75mm dia steel balls at connections				
A	To decorative grilles	m2	289		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
B	Over 300 mm ; Internally	m2	289		
C	Over 300 mm ; externally	m2	289		
	TOTAL FOR SHS FENCING GRILLES CARRIED FORWARD TO SUMMARY OF SECTION NO.20				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT NO 6</u>				
	<u>GATES</u>				
	Vehicular Gate				
A	Double leaf mild steel vehicular gate overall size 6200 x 2400mm high purpose made mild steel vehicular gate in 75 x 50 x 3mm framing and middle rail; 25 x25 x 3mm internal members at 75mm centres; 300 x 6200 x 2mm plate welded over middle rail on both sides; purpose made heavy duty hinges;	No	2		
	Pedestrian gate				
B	1200 x 2400mm high pedestrian gate in 50 x 50 x 3mm framing and 25 x 25 x 3mm intervals at 75mm centres; to architect details	No	2		
	PAINTING AND DECORATING				
	One coat primer red oxide colour; one undercoat crown 'solo' ultra undercoat and two finishing coats colour to approval all to crown paint or other equal and approved				
	Metal surfaces				
C	Over 300 mm ; Internally	m2	36		
D	Over 300 mm ; externally	m2	36		
	Canopy at exit and entry				
E	Provide a Provisional Sum Ksh 10,000,000 (Ksh Ten Million) for canopies at entry and exit	Sum	1		10,000,000
	TOTAL FOR GATES CARRIED FORWARD TO SUMMARY OF SECTION NO. 20				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO.20				
	BOUNDARY WALL AND GATES				
	<u>SECTION SUMMARY- BOUNDARY WALL AND GATES</u>				
1	SUB-STRUCTURE	Page	20/4		
2	FRAME	Page	20/5		
3	WALLING	Page	20/6		
4	WALL FINISHES	Page	20/9		
5	SHS FENCING GRILLES	Page	20/8		
6	GATES	Page	20/9		
	Carried to Grand Summary				
	Section No. 20				
	BOUNDARY WALL AND GATES				

CIVIL WORKS

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO. 21				
	CIVIL WORKS				
	ELEMENT NO. 1				
	ROADS AND PARKING				
	Site Preparation				
A	Clear the construction sites of all bushes, shrub, vegetation, weeds, undergrowth, hedges and the like including cutting down small trees between 0-300mm girth, grubbing up roots and removing from site as necessary	m2	6,000		
	<u>Cut down trees including grubbing roots and removing from site, as described</u>				
B	Cut down trees between 300 - 600mm girth, grub up their roots and cart away arisings	No	3		
C	Ditto 600 - 900mm girth ditto	No	1		
D	Ditto 900 - 1200mm girth ditto	No	1		
E	Ditto 1200 - 1500mm girth ditto	No	1		
F	Ditto 1500 - 1800mm girth ditto	No	1		
	EXCAVATION AND EARTH WORKS				
G	Excavate oversite soil average 150 mm deep and cart away from site	m2	6,000		
H	Bulk excavation; starting from reduced level:- Not exceeding 1.5m deep	m3	6,000		
	DISPOSAL				
	Surplus excavated materials				
I	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	6,000		
	Backfill material				
J	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	6,000		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>FILLING Hardcore Supply approved hardcore on site or other equal and approved base material in making up levels. Over 300mm thick; depositing and compacting in layers maximum 150 mm thick.</p>	m3	3,000		
B	<p>Stone or quarry dust Blinding surfaces of fill 50 mm thick</p>	m2	6,000		
C	<p>ANTI TERMITE AND HERBICIDE TREATMENT Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described To surfaces of blinded hardcore</p>	m2	6,000		
D	<p><u>Supply and fix paving blocks squared/staggered pattern</u> 80mm thick heavy duty cabro paving blocks (minimum crushing strength of 50N/mm2 irrespective of shape) laid on and including 50mm thick river sand / quarry sand bed laid to falls (2.5% in approved direction) and crossfalls in approved herringbone bond pattern to the satisfaction of the Engineer</p>	m2	5,700		
E	<p>90mm thick heavy duty lattice paving blocks (minimum crushing strength of 108N/mm2) laid to falls (2.5% in approved direction) and crossfalls in approved pattern to the satisfaction of the Engineer</p>	m2	1,600		
F	<p>Supply and fix 600 x 600 x 50mm thick medium density precast concrete paving slabs laid on, and including, 50mm thick sand bed as per the manufacturers instructions</p>	m2	300		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Kerbs & Channel				
	<u>Precast concrete class 20 finished fair on all exposed surfaces, bedded, jointed and pointed in cement and sand (1:5) mortar</u>				
A	250 x 125mm edge restraint kerb and channel including 325 x 100 mm concrete class "P" bed with similar haunching to sides including haunching and bedding as per the Engineer's details and all necessary excavation and formwork	m	1,863		
B	Ditto but curved on plan	m	500		
	Road Marking				
C	Prepare and apply one undercoat three coats of first grade long lasting reflective road marking paint black and white colour in kerbs	m	500		
D	Prepare and apply one undercoat three coats of first grade long lasting reflective road marking paint, yellow in colour on road surfaces	m	500		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT		
	ROADS AND PARKING COLLECTION PAGE						
	Total Brought Forward from Page No.		Page No. 21/1 21/2 21/3				
	TOTAL FOR ROADS AND PARKING CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> </table>		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO. 2				
	EXTERNAL DRAINAGE				
	SURFACE WATER DRAINAGE				
	Excavations Including Maintaining & Supporting Sides & Keeping Free From Water, Mud & Fallen Materials				
A	Excavations 0 - 1.5m for Bulk excavation to reduce levels	m3	1,200		
	DISPOSAL				
	Surplus excavated materials				
B	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	1,200		
	Backfill material				
C	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	1,200		
	Precast concrete invert block drains				
	<u>Invert blocks storm water drains bonded and jointed with cement, sand screed with and including removable cover slabs with perforations as necessary including quarry dust bed and concrete bed to appropriate fall, all laid to withstand vehicular traffic [Rate to include, tamping & compacting bottoms/ sides of excavations, making good disturbed surroundings, disposal of surplus soil and connection to gulleys]</u>				
D	600mm diameter x 450 x 225mm storm drains	m	976		
	Open channel drain with grating				
E	Reinforced concrete channel drain consisting of 600 deep (internally) x 300mm wide x 150mm thick drain with 300mm wide mild steel grating cover comprising T25 bars welded at 50mm centers to 25 x 25 x 6mm angles welded on 75x75x6mm angle frame each unit fabricated in lengths not exceeding 2.0m; Concrete in class 25 concrete waterproofed with 'Sika' additive or other equal and approved (Rate to include cost of all concrete, formwork, reinforcement, and associated works)	m	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	<p>Culverts Head walls overall length 1410m long x 1325mm deep with 200mm thick walling masonry stone bedded and bonded with cement sand mortar 1:3 stone surfaces neatly plastered. [Rate to include all mass concrete base and connection to culvert pipe or open drain channel and make good all surroundings]</p>	No.	10		
B	<p>Precast concrete pipe complete on 50mm thick class 15 mass concrete blinding and 150mm thick class 20 concrete soround [Rate to include concrete suround fill and making good surroundings] 300mm internal diameter precast concrete pipes</p>	m	30		
D	<p>Box Culvert Reinforced concrete box culvert consisting of 1200 x 800mm wide x 200mm thick drain ; reinforced with and including T25 reinforcement bars; Concrete in class 25 concrete waterproofed with 'Sika' additive or other equal and approved (Rate to include cost of all concrete, formwork, reinforcement, and associated works)</p>	m	70		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SURFACE WATER DRAINAGE COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 21/5		
			21/6		
	TOTAL FOR SURFACE WATER DRAINAGE CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO. 3				
	FOUL WATER DRAINAGE				
	Excavations Including Maintaining & Supporting Sides & Keeping Free From Water, Mud & Fallen Materials				
A	Excavations 0 - 1.5m for Bulk excavation to reduce levels	m3	450		
	DISPOSAL				
	Surplus excavated materials				
B	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	450		
	Backfill material				
C	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	450		
	Foul water pipework				
	<u>Heavy duty PVC waste water pipe on 50mm thick mass concrete blinding and 150mm thick concrete surround [Rate to include concrete surround fill and making good surroundings]</u>				
D	300mm internal diameter pvc pipes	m	100		
E	150mm internal diameter pvc pipes	m	350		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<p>Manholes</p> <p><u>The following manholes of various sizes to be executed in accordance with the Engineer's drawings, average depths as stated complete and including filling, 150mm thick concrete walling, 150mm thick concrete floor slab Class 20, concrete benching Class 15, 20mm diameter cast iron stepping irons where necessary, internal and external finishes, surfaces waterproofed with "Sika-1" or "Cemflex" compounds to manufacturer's specification and complete with and including heavy duty double air seal cover and frame, all to Engineer's details. (Rate to include cost of all excavations, concrete, formwork, reinforcement, and associated works)</u></p>				
A	Internal dimensions: 700x 600x 1000mm deep	No.	20		
B	Internal dimensions: 1200x 1200x 1000mm deep	No.	30		
	<p>Inspection chambers</p> <p><u>The following inspection chambers of various sizes to be executed in accordance with the Engineer's drawings; average depths as stated complete and including filling, 150mm thick masonry work, 150mm thick concrete floor slab Class 20, concrete benching Class 15, 20mm diameter cast iron stepping irons where necessary, internal and external finishes, heavy duty double air seal cover and frame, all to engineer's details. (Rate to include cost of all excavations, concrete, formwork, reinforcement, and associated works)</u></p>				
C	Internal dimensions: 700x 600x 1000mm deep	No.	20		
	<p>Gulley traps</p> <p>Supply and lay 730 x 730 x 500mm deep gulley traps complete with 400 x 400 x 10mm thick mild steel grating welded to 10mm thick mild steel frame at 30mm centres, hot galvanized and painted to approval [Rate to include excavation, 150mm thick plastered masonry walls, concrete base, concrete cover too receive grating and all surface finishes].</p>				
D		No.	30		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT		
	FOUL WATER DRAINAGE COLLECTION PAGE						
	Total Brought Forward from Page No.		Page No. 21/8 21/9				
	TOTAL FOR FOUL WATER DRAINAGE CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> </table>		

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO. 4				
	JOGGING TRACK				
	Site Preparation				
A	Clear the construction sites of all bushes, shrub, vegetation, weeds, undergrowth, hedges and the like including cutting down small trees between 0-300mm girth, grubbing up roots and removing from site as necessary	m2	842		
	<u>Cut down trees including grubbing roots and removing from site, as described</u>				
B	Cut down trees between 300 - 600mm girth, grub up their roots and cart away arisings	No	1		
C	Ditto 600 - 900mm girth ditto	No	1		
D	Ditto 900 - 1200mm girth ditto	No	1		
E	Ditto 1200 - 1500mm girth ditto	No	1		
F	Ditto 1500 - 1800mm girth ditto	No	2		
	EXCAVATION AND EARTH WORKS				
G	Excavate oversite soil average 150 mm deep and cart away from site	m2	842		
H	Bulk excavation; starting from reduced level:- Not exceeding 1.5m deep	m3	842		
	DISPOSAL				
	Surplus excavated materials				
I	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	842		
	Backfill material				
J	Imported subgrade fill material(min CBR 15%) on compacted sub-grade	m3	842		
	Murram sub-base				
K	200mm thick murram sub-base (min CBR 30)	m2	842		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	FILLING				
	Hardcore				
	Supply approved handpacked hardcore on site or other equal and approved base material in making up levels.				
A	Over 300mm thick; depositing and compacting in layers maximum 150 mm thick; consolidated under road and compacted and rolled to fall to 100% BS compaction	m3	421		
	Stone or quarry dust				
	Blinding surfaces of fill				
B	50 mm thick	m2	842		
	ANTI TERMITE AND HERBICIDE TREATMENT				
	Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
C	To surfaces of blinded hardcore	m2	842		
	Bituminous road surfacing, rolled				
D	50mm thick asphalt concrete wearing course	m2	842		
E	Clean base and primer with MCO bitumen emulsion at rate of 0.75l/m2	m2	842		
	Kerbs & Channel				
	<u>Precast concrete class 20 finished fair on all exposed surfaces, bedded, jointed and pointed in cement and sand (1:5) mortar</u>				
F	250 x 125mm edge restraint kerb and channel including 325 x 100 mm concrete class "P" bed with similar haunching to sides including haunching and bedding as per the Engineer's details and all necessary excavation and formwork	m	526		
G	Ditto but curved on plan	m	50		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	JOGGING TRACK COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 21/11 21/12		
	TOTAL FOR JOGGING TRACK CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO. 5				
	SWIMMING POOL				
	<u>EXCAVATION AND CONCRETE WORKS</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	400		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	400		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	600		
D	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	600		
E	Exceeding 3.0 m but not exceeding 4.5 m deep	m3	200		
	DISPOSAL				
	Surplus excavated materials				
F	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	1,400		
G	Extra over 300mm thick, clearing loose material at bottom of excavated surface	m3	120		
H	Grade,level and compact to falls,cross falls and slopes; compact to 105% MDD	m2	400		
	Backfill material				
I	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	1,400		
	Disposal of water				
J	Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
	Plunking and strutting				
K	Planking and strutting to sides of all excavations : keep excavations free from all fallen materials; including shoring where applicable	Item	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Water bars; standard PVC bulb edged strip; as "sika" or other equal and approved				
A	200mm wide; casting into concrete; temporary fixing to formwork; all in accordance with manufacturer's printed instructions	m	50		
	FILLING				
	Hardcore				
	Supply approved hardcore on site or other equal and approved base material in making up levels.				
B	Over 300mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	125		
	Stone or quarry dust				
	Blinding surfaces of fill				
C	50 mm thick	m2	250		
	ANTI TERMITE AND HERBICIDE TREATMENT				
	Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
D	To surfaces of blinded hardcore	m2	250		
	Damp-proof membranes				
E	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	250		
	CONCRETE WORK				
	Insitu blinding ; mass concrete ; class 15/20mm to:				
F	Raft foundation; average 50 mm thick; with and including waterproofing admixture as "sika" or equal and approved	m2	250		
	Insitu :class 25/20mm; Vibrated; Reinforced				
G	Horizontal; 200mm thick raft; with and including waterproofing admixture as "sika" or equal and approved	m2	250		
H	Steps	m3	2		
I	Overflow channels	m3	10		
J	200mm thick walls	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Sump overall size 500 x 500 x 500mm deep; 200mm thick RC walls REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.	No	2		
B	Assorted sizes FORMWORK TO INSITU CONCRETE Form work generally Edges of raft slab	kg	20,100		
C	Girth 225 mm to 300 mm Risers of steps and staircases	m	50		
D	Girth 75mm to 150mm Sides ; vertical or battering	m	20		
E	Vertical sides of walls; curved to required radii	m2	200		
F	Sides of channels; with I no steps with rounded top edging	m2	40		
G	Vertical sides of sump walls WATERPROOFING PROTECTIVE SCREED 40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing	m2	2		
H	Horizontal surface of raft	m2	250		
I	Channels	m2	95		
J	Sumps	m2	2		
K	Rc walls	m2	200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastic smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
A	Horizontal surface of raft	m2	250		
B	Channels	m2	95		
C	Sumps	m2	2		
D	Rc walls	m2	200		
E	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally				
F	Walls; vertical; internal	m2	250		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
G	Floors; horizontal; internal; receive tiles	m2	100		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
A	Walls; vertical; internal	m2	250		
B	Floors and steps; horizontal	m2	100		
	Ladder				
C	500mm wide x 2200mm high stainless steel ladder; built into concrete wall and concrete slab; including fixing lugs	No	2		
D	Ditto 1200mm high	No	2		
	Grating				
E	500mm wide plastic grating to details	m	60		
	Pool terrace				
F	Supply and fix 600 x 600 x 50mm thick medium density precast concrete paving slabs laid on, and including, 50mm thick sand bed as per the manufacturers instructions	m2	300		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section NO. 21				
	SWIMMING POOL				
	<u>SECTION SUMMARY-SWIMMING POOL</u>				
	Total Brought Forward from Page No.		Page No. 21/14		
			21/15		
			21/16		
			21/17		
			21/18		
	TOTAL FOR SWIMMING POOL CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO. 6				
	WATER FOUNTAIN				
	<u>EXCAVATION AND CONCRETE WORKS</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	200		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	200		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	300		
D	Exceeding 1.5 m but not exceeding 3.0 m deep	m3	300		
	DISPOSAL				
	Surplus excavated materials				
E	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	600		
F	Extra over 300mm thick, clearing loose material at bottom of excavated surface	m3	200		
G	Grade,level and compact to falls,cross falls and slopes; compact to 105% MDD	m2	200		
	Backfill material				
H	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	600		
	Disposal of water				
I	Allow for keeping excavation free from all water including spring or running water by pumping, bailing or otherwise	Item	1		
	Plunking and strutting				
J	Planking and strutting to sides of all excavations : keep excavations free from all fallen materials; including shoring where applicable	Item	1		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Water bars; standard PVC bulb edged strip; as "sika" or other equal and approved				
A	200mm wide; casting into concrete; temporary fixing to formwork; all in accordance with manufacturer's printed instructions	m	115		
	FILLING				
	Hardcore				
	Supply approved hardcore on site or other equal and approved base material in making up levels.				
B	Over 300mm thick; depositing and compacting in layers maximum 150 mm thick.	m3	100		
	Stone or quarry dust				
	Blinding surfaces of fill				
C	50 mm thick	m2	200		
	ANTI TERMITE AND HERBICIDE TREATMENT				
	Applying " Bayer premise 200 SC " or equal and approved insecticide with a ten year guarantee as described				
D	To surfaces of blinded hardcore	m2	200		
	Damp-proof membranes				
E	1000 gauge damp proof membrane over blinded hardcore including 300 mm end & side laps	m2	200		
	CONCRETE WORK				
	Insitu blinding ; mass concrete ; class 15/20mm to:				
F	Raft foundation; average 50 mm thick; with and including waterproofing admixture as "sika" or equal and approved	m2	200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Insitu :class 25/20mm; Vibrated; Reinforced				
A	Horizontal; 200mm thick raft; with and including waterproofing admixture as "sika" or equal and approved	m2	200		
B	200mm thick walls; with and including waterproofing admixture as "sika" or equal and approved	m2	188		
	REINFORCEMENT (PROVISIONAL)				
	T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
C	Assorted sizes	kg	3,760		
	FORMWORK TO INSITU CONCRETE				
	Form work generally				
	Sides ; vertical or battering				
D	Vertical sides of walls; curved to required radii	m2	376		
	Edges of slab				
E	150 to 225 mm wide	m	116		
	WATERPROOFING				
	PROTECTIVE SCREED				
	40 mm thick cement and sand (1:4) with "Sika-1" or other equal and approved integral waterproofing additive applied to manufacturer's printed instructions; to receive waterproofing				
F	Horizontal base slab	m2	200		
G	Rc walls	m2	376		
	Works to be executed by an approved specialist				
	Supply and apply Two-component highly flexible cementitious mortar waterproofing (3 coats) as mapelastick smart as supplied by "Mapei Construction Chemicals" other equal and approved; including alkali resistant glass fibre mesh mapenet 150 and all necessary surface preparations ; all in accordance with the manufacturer`s printed instructions				
H	Horizontal surface of raft	m2	200		
I	Rc walls	m2	376		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Allow for providing a written guarantee of ten (10) years to the employer (effective from the date of application) for all waterproofing works measured herein in these bills from an approved sub-contracting firm	Item	1		
	Screed; cement and sand (1:4)				
	12 mm thick one coat backing ; wood floated to receive wall tiles (m/s) to walls generally (m/s) ; internally				
B	Walls; vertical; internal	m2	376		
	BEDS OR BACKINGS				
	Screed; cement and sand (1:4)				
	40 mm thick one coat beds; wood floated; to concrete or block work base; generally to				
C	Floors; horizontal; internal; receive tiles	m2	200		
	TILE, SLAB OR BLOCK FINISHINGS				
	Supply and fix 30 x 30mm non slip mosaic tiles; including fixing with approved adhesive and spacers; bedding in cement mortar (1:4) and jointing grouting joints with proprietary grouting ; generally to				
	10 mm thick Butt joints strait both ways; to cement and sand base (m/s) to				
D	Walls; vertical; internal and external	m2	376		
E	Floors ; horizontal	m2	200		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 21				
	WATER FOUNTAIN				
	<u>SECTION SUMMARY-WATER FOUNTAIN</u>				
	Total Brought Forward from Page No.		Page No. 21/20		
			21/21		
			21/22		
			21/23		
	TOTAL FOR WATER FOUNTAIN CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	ELEMENT NO. 7				
	MEP BUILDERS WORK				
	<u>STREET LIGHTING</u>				
	Site Preparation				
A	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	100		
	EXCAVATION AND EARTH WORKS				
B	Excavate oversite soil average 150 mm deep and cart away from site	m2	100		
	Bulk excavation; starting from reduced level:-				
C	Not exceeding 1.5m deep	m3	100		
	DISPOSAL				
	Surplus excavated materials				
D	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	100		
	Backfill material				
E	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	100		
	DISPOSAL				
	Surplus excavated materials				
F	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	100		
	CONCRETE WORK				
	Insitu blinding ; mass concrete ; class 15/25mm				
G	Bases	m2	100		
	Insitu ; mass concrete ; class 25/25mm				
H	Bases	m3	100		
	Sides ; vertical or battering				
I	Column bases	m2	400		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
A	Assorted sizes(T8-T12mm bars)	kg	8,000		
	SERVICE DUCTS				
	Site Preparation				
B	Clear site of all bushes, shrubs, small trees, grub up roots and remove from site	m2	125		
	EXCAVATION AND EARTH WORKS				
C	Excavate oversite soil average 150 mm deep and cart away from site	m2	125		
	Bulk excavation; starting from reduced level:-				
D	Not exceeding 1.5m deep	m3	63		
	DISPOSAL Surplus excavated materials				
E	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	63		
	Backfill material				
F	Imported murrum or other equal and approved material : compacted in layers of not exceeding 200mm to 105% MDD	m3	63		
	DISPOSAL Surplus excavated materials				
G	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	63		
	CONCRETE WORK Insitu blinding ; mass concrete ; class 15/25mm				
H	Bases	m2	125		
	Insitu ; mass concrete ; class 25/25mm				
I	Bases	m3	63		
	Sides ; vertical or battering				
J	Column bases	m2	250		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	REINFORCEMENT (PROVISIONAL) T-Bars; Deformed steel ribbed reinforcement bars; B.S. 4449 including bends, hooks, tying wire, distance blocks, and spacers.				
A	Assorted sizes(T8-T12mm bars)	kg	5,040		
	<u>BIODIGESTERS</u>				
B	Provide a Provisional Sum Ksh 5,000,000 (Ksh Five Million) for builders work associated with biodigester	Sum	1		5,000,000
	<u>TREATMENT PLANT</u>				
C	Provide a Provisional Sum Ksh 5,000,000 (Ksh Five Million) for builders work associated with treatment plants	Sum	1		5,000,000
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 21				
	MEP BUILDERS WORK				
	<u>SECTION SUMMARY-MEP BUILDERS WORK</u>				
	Total Brought Forward from Page No.		Page No. 21/25		
			21/26		
			21/27		
	TOTAL FOR MEP BUILDERS WORK CARRIED FORWARD TO SUMMARY OF SECTION NO. 21				

LANDSCAPING

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>SECTION No. 22</u>				
	LANDSCAPING				
	<u>SOFT LANDSCAPING (Approximately 4,000 SM)</u>				
	<u>Site Clearance and Excavations</u>				
A	Bulk excavation; starting from reduced level:- Not exceeding 1.5m deep	m3	6,000		
	DISPOSAL				
	Surplus excavated materials				
B	Load and cart away surplus excavated material from site to contractors approved tipping area off site	m3	6,000		
C	Clear the site of all unwanted wastes including existing unwanted plant materials, grubbing up their roots and excavate oversite commencing from ground level, average 300 mm deep top soil to remove all turf, weeds and any deleterious materials; including carting away all arising wastes, raking and fine levelling of the ground.	SM	6,000		
D	Supply selective broad leaf herbicide as Badge or equally approved and apply to manufactureres specifications	SM	6,000		
E	Manually uproot all grass based weeds and cart away from site.	SM	6,000		
	<u>Top Dressing to All Lawn areas</u>				
F	Supply approved good quality red/loam soil for top dressing all lawn areas as directed by the landscape Architect ; Average depth =50mm.	CM	300		
	<u>Supply and Application of Fertilizer</u>				
G	Supply MavuNo Planting Fertilizer (NPK 10:26:10 + TE) or equally approved and apply to manufacurers specifications	Kg	300		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Supply MavuNo Top Dressing +SULPHUR+CALCIUM in Nitrogen fertilizers (>20% N) or equally approved and apply to manufacturers specifications	Kg	400		
B	450mm thick imported red soil, wheeling, depositing, spreading, scarifying, compacting, trimming, grading to levels, falls, or contour surfaces of deposited topsoil and existing subsoil under, ready to receive plants (m.s)	m3	2,700		
	<u>INSTALLATION OF GRASS (GRASSING):</u>				
	<u>Supply, plant, water, weed and tend well undermentioned grass species till full establishment. Grass should also be rolled with a light weight roller to even out 'bumpy' areas. This should be carried out one to two weeks after installation.</u>				
C	Arabic grass sprigs spaced at 100mm centres, both ways	SM	4,000		
D	Pennisetum setaceum Kikuyu grass sprigs spaced at 100mm centres, both ways	SM	2,000		
	<u>INSTALLATION OF SMALL & LARGE GROUNDCOVERS:</u>				
	<u>Pits excavation for Small Groundcovers - (Approx. 1,000 No.)</u>				
E	Excavate circular pits, average 300mm diameter, commencing at existing ground level but Not exceeding 0.45 metres depth average 300mm deep; cart away excavated material arising	CM	424		
	<u>Backfilling of Planting Pits:</u>				
F	Backfill excavated planting pits with approved imported red/loam soil mixed with farmyard manure at the ratio 3:1, 350mm deep.	CM	424		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>Planting of Small Groundcovers (Approx. 400 No.)</u>				
	<u>Supply, plant, weed, water and tend well under-mentioned</u>				
	<u>Assorted species of groundcovers till full establishment;</u>				
	<u>Small Groundcovering Plants:</u>				
A	<i>Agapanthus africanus</i> AFRICAN LILY)- 'Blue' flowers	No	50		
B	<i>Barleria cristata</i>	No	10		
	<u>INSTALLATION OF SMALL & LARGE GROUNDCOVERS:</u>				
A	<i>Echeveria elegans</i>	No	50		
B	<i>Euphorbia mili</i> (CROWN OF THORNS)	No	30		
C	<i>Gazania</i> spp	No	50		
D	<i>Guzmania</i> bromeliads (BROMELIADS)	No	20		
E	<i>Hedera helix</i> (ENGLISH IVY)	No	30		
F	<i>Haemerocalis fulva</i> (DAY LILY)	No	20		
G	<i>Ivooverus</i> spp.	No	20		
H	<i>Kalanchoe blossfeldiana</i>	No	20		
I	<i>Lampranthus productus</i> (ICE PLANT)	No	20		
J	<i>Lavendula officinalis</i> (ENGLISH LAVENDER)	No	20		
K	<i>Liriope muscari</i> (LIRIOPE GRASS)	No	20		
L	<i>Ophiopogon japonicus</i> (MONDO GRASS)	No	20		
M	<i>Sedum rubrotinctum</i>	No	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>INSTALLATION OF SHRUBS:</u>				
	<u>Pits excavation for Shrubs - (Approx. 250 No. Pits)</u>				
A	Excavate circular pits, average 600mm diameter, commencing at existing ground level but Not exceeding 1.5 metres depth, average 600mm deep; cart away excavated material arising	CM	200		
	<u>Backfilling of Planting pits</u>				
B	Backfill excavated planting pits with approved imported red/loam soil mixed with farmyard manure at the ratio 3:1, 600mm deep.	CM	200		
	<u>Planting of Shrubs (Approx. 250 No.)</u>				
	<u>Supply, plant, weed, water and tend well under-mentioned</u>				
	<u>Assorted species of Shrubs till full establishment;</u>				
C	Agave attenuata (AMERICAN AGAVE)	No	25		
D	Abutilon malritarum	No	20		
E	Breynia nivosa	No	20		
F	Brunfelcia pauciflora (YTT)	No	20		
G	Yucca aloifolia	No	25		
H	Cycas revoluta (JAPANESE CYCAD)	No	10		
I	Hamelia patens (FIRE BUSH)	No	10		
J	Heliconia rostrata	No	10		
K	Hibiscus rosasinensis (YELLOW)	No	20		
L	Pennisetum setaceum (RED)	No	10		
M	Pennisetum setaceum (WHITE)	No	10		
N	Phormium tenax (GIANT)	No	50		
O	Phormium tenax (RED)	No	10		
P	Strelitzia reginae (BIRDS OF PARADISE)	No	10		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>INSTALLATION OF TREES:</u>				
	<u>Pits excavation for Trees - (Approx. 150 No. Pits)</u>				
A	Excavate pits, 1000x1000mm, commencing at existing ground level but Not exceeding 1.5 metres depth aver. 1000mm deep and and cart away excavated material arising.	CM	250		
	<u>Backfilling of Planting pits</u>				
B	Backfill excavated planting pits with approved imported red/loam soil mixed with farmyard manure at the ratio 4:1, 1000mm deep.	CM	250		
	<u>Planting of Trees</u>				
	<u>Supply, plant, weed, water and tend well undermentioned 150 No. trees/large shrubs till full establishment and support the same with strong bamboo stakes, adequate in thickness for each tree (generally between 30 and 50 mm diameter)</u>				
	<u>Ordinary Trees/Large Shrubs (52No.)</u>				
C	Jacaranda mimosifolia	No	50		
D	Roystonea regia (ROYAL PALM)	No	30		
E	Chrysalidocarpus lutascens (GOLDEN CANE PALMS)	No	20		
F	Cupressus sempervirens (ITALIAN CYPRESS)	No	20		
G	Filicium deciepens (THIKA PALM)	No	30		
H	Calodendrum capense (CAPE CHESTNUT)	No	20		
I	Schinus terebinthifolius (BRAZILLIAN PEPPER TREE)	No	20		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>OTHER REQUIREMENTS:</u>				
	<u>Landscape Maintenance:</u>				
A	Provide landscape maintenance service to the landscaped garden for twelve (12) months upon practical completion in order to monitor plants growth; Maintenance works for plants and grass shall include; watering,weeding, spraying against pests and diseases, and mowing grass to acceptable height as outlined in the Landscape Specification document.	SM	6,000		
	<u>Supply of Lawn Mower:</u>				
B	Supply 1 No. Self-propelled Deutscher Lawn mower with two forward gears and one reverse gear and 26" cutting blade; Series H660 with Briggs and Stratton Engine (13HP) for use in the lawn areas.This shall be used exclusively on the client's site and shall remain the property of the client upon completion of landscape maintenance (Defects Liability) Period.	No	1		
	<u>Hard-Landscaping Works:</u>				
C	Supply and install precast 6 tier Fountain 3.0m high and 7.4 m diameter spill collection base complete with electrical and mechanical fittings to architect's details	No	2		
D	Ditto 5.7m diameter	No	1		
E	Ditto 3.3m diameter	No	1		
F	Supply and install mahogany garden benches on and including mild steel framework-size 3000 x 700 x 900mm high; varnished	No	5		
G	Supply and install precast planters size 420 x 420 x 700mm high	No	20		
H	Ditto 600 x 600 x 800mm high	No	50		
I	Ditto 580mm dia x 700mm high	No	20		
J	Ditto 730mm dia x 700mm high	No	10		
	Carried to Collection				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Supply and install life sized recycled metal life sized (H:3.5m L:5.9m W:1.6m) Elephant sculptures to approval	No	1		
B	Supply and install life sized(H:5.5m L:3.6m W:1.3m) topiary wire frame giraffe sculptures to approval	No	1		
Carried to Collection					

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 22				
	LANDSCAPING				
	<u>SECTION SUMMARY- LANDSCAPING</u>				
	Total Brought Forward from Page No.		Page No. 22/1		
			22/2		
			22/3		
			22/4		
			22/5		
			22/6		
			22/7		
	Carried to Grand Summary				
	Section No. 22				
	LANDSCAPING				

SIGNAGE AND ARTWORK

Note:

1. The rates and prices shall be inclusive of VAT at 16%

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION No 23				
	<u>ELEMENT No 1</u>				
	SIGNAGE				
	<u>Supply the following in high grade brass plate treated with sealer and chemical etching ; graphics and lettering finished in 3M vinyl cut outs as per architect's details; Allow fixing to manucaturer's instructions</u>				
	<u>Floor Markings</u>				
A	600 x 400 mm floor markings	No	30		
	<u>Washroom Signages</u>				
B	200 x 250 mm 'LADIES' signage	No	50		
C	Ditto 'GENTS'	No	50		
D	Ditto 'DISABLED'	No	20		
	<u>Door Signages</u>				
E	500 x 100 mm door signage	No	500		
F	700 x 200 mm door signage	No	200		
G	400 x 100 mm door signage	No	100		
H	300 x 100 mm door signage	No	100		
I	200 x 200 mm door signage	No	100		
	<u>Directional signages</u>				
J	450 x 700 mm signage	No	40		
	<u>Directory Boards</u>				
K	3,550 x 3,450 mm main directory board	No	2		
L	1,500 x 1,500 mm floor mini directory board	No	21		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Signage and Artwork

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Convex mirrors 18" dia	No	4		
B	Basement headroom Fabrication made of MS structure inside ;3mm ACP on top and automative PU paint 3M retro cut vinyl Type IX to pasted on front lit with LED modules size 3500 x 500mm high	No	2		
C	Basement parking signages Fabrication made of MS structure inside ;3mm ACP on top and automative PU paint 3M retro cut vinyl Type IX to pasted on front lit with LED modules size 1200 x 350mm high	No	20		
D	Signage made with 3mm ACP pasted with 3M plotted cut vinyl reflective 1800 x 300mm high	No	2		
E	Ditto 600 x 600mm high	No	5		
F	Ditto 1000 x 600mm high	No	5		
G	Ditto 350 x 350mm high-parking signages	No	100		
H	Caution signages Plotter cut 3m reflective vinyl pasted on and including 3M thick ACM panel size 500 X 800mm high	No	2		
I	Ditto 200 x 250mm high	No	10		
J	600mm dia	No	5		
K	Fire Exit Signages 300 x 150 mm 'FIRE EXIT' hanging illuminated signage	No	6		
L	Fire Action Sign Plotter cut 3M reflective vinyl UV printed pasted on and including 3mm ACP panel A3 size	No	4		
M	Fire Assembly point with pole Signage in 3mm router cut ACP and print vinyl pasted on and including ACP sheet site mounted on and including 50mm CHS painted pole height 1800mm	No	2		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Signage and Artwork

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>Evacuation Plan</u>				
A	Plotter cut 3M reflective vinyl UV printed pasted on and including 3mm ACP panel A3 size	No	8		
	<u>Main Signages</u>				
B	6000 mm x 2000 mm x 100 mm Thick self standing illuminated 'CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING' signage to Architect's approval.	No	1		
C	3D day time black and night time white effect acrylic in 2mm thick 304 stainless steel ; complete with waterproof LED module , power supply; fixing with screws; complete with MS back support structure; powder coated size 20,000 x 1000mm high	No	1		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Signage and Artwork

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SIGNAGE COLLECTION PAGE				
	Total Brought Forward from Page No.		Page No. 23/1		
			23/2		
			23/3		
	TOTAL FOR SIGNAGE CARRIED FORWARD TO SUMMARY OF SECTION NO. 23				

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT No1</u>				
	<u>ARTWORK</u>				
	Art works in the following Bills of Quantities will be executed through qualified artist or domestic subcontractors with experience in similar works				
	The broad themes for the artworks will be related to social , cultural and landscape (<i>flora, fauna and landform</i>) features of Kenya				
A	Bronze sculptural artistic work in 3D manifestations, approximate size 1200 x 1200mm set in alcove in wall(m/s) cast in epoxy resin and finished in bronze	No	4		
B	Bronze ornamental shield and two spears within an area of 1500 x 1500mm; to approval	No	4		
C	Painterly artistic work approximately size 1200 x 1200mm either on canvas or other approved medium placed on and including 50x25mm moulded artistic podo or stained moulded mahogany frame; complete with hardboard backing and glass cover	No	20		
D	Wall photo murals in vinyl approximately size 1200 x 1200mm; ditto	No	30		
	TOTAL FOR ARTWORK CARRIED FORWARD TO SUMMARY OF SECTION No. 23				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Signage and Artwork

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No 23				
	SIGNAGE AND ARTWORK				
	<u>SECTION SUMMARY- SIGNAGE AND ARTWORK</u>				
1	SIGNAGE	Page	23/4		
2	ARTWORK	Page	23/5		
	Carried to Grand Summary				
	Section No 23				
	SIGNAGE AND ARTWORK				

DAYWORKS AND SCHEDULE OF RATES

Note:

1. The rates and prices shall be inclusive of VAT at 16%

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Dayworks and Schedule of Rates

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO. 24				
	<u>ELEMENT No 1</u>				
	DAYWORKS				
	<u>Rate to include all operational costs , maintenance, fuel, idle time, travelling, overtime, profits and overheads. Payment will be made for time employed upon the works only. Where unrealistically high rates are used, the Project Quantity Surveyor will have the discretion to make any suitable adjustments to reflect the going market rates. All items must be priced.</u>				
	<u>Provision of labour</u>				
A	Porter	Hrs	10		
B	Semi-skilled	Hrs	10		
C	Mason/	Hrs	10		
D	Steel fixer	Hrs	10		
E	Carpenter	Hrs	10		
F	Painter	Hrs	10		
G	Tile fixer	Hrs	10		
H	Welder/Electrician	Hrs	10		
I	Foreman	Hrs	10		
J	Carpenter for joinery	Hrs	10		
K	Plumber	Hrs	10		
L	Electrician	Hrs	10		
M	Plumber	Hrs	10		
N	Electrician	Hrs	10		
	<u>Provision of plant</u>				
	<u>Any plant to be provided must be in good working condition. The day works rate provided must be inclusive of all running costs and overheads</u>				
O	Lorry (minimum 8 tonne capacity - or similar)				
P	Tipper (8 tonne capacity - or similar)	Hrs	5		
Q	Compressor	Hrs	5		
R	Roller	Hrs	5		
S	Plate compactor	Hrs	5		
T	Wheel loader	Hrs	5		
U	Grader	Hrs	5		
V	Crawl loader	Hrs	5		
W	Jack hammer	Hrs	5		
X	Bending machine	Hrs	5		
Y	Dragline	Hrs	5		
Z	Sand blast machine	Hrs	5		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Dayworks and Schedule of Rates

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
A	Dewatering pump	Hrs	5		
B	Concrete mixer	Hrs	5		
C	Dumper	Hrs	5		
D	Hand tools (power drills, grinders, torque wrenches, etc.)	Hrs	5		
E	Excavator	Hrs	5		
F	Bulldozer	Hrs	5		
G	Motor grade	Hrs	5		
H	Roller	Hrs	5		
I	Portable generator	Hrs	5		
J	3-Phase power generator	Hrs	5		
K	Vibrator	Hrs	5		
L	Hoist	Hrs	5		
	<u>Provision of material</u>				
	<u>Any materials to be provided must be of good quality and upto standard for use in permanent works. The rate provided must be inclusive of all delivery costs and overheads</u>				
M	Ordinary portland cement @ 50kg bags	Bags	10		
N	Clean river sand	Tons	10		
O	12-20mm graded course aggregate	Tons	10		
P	Manufactured sand / Quarry dust / 0-6mm aggregate	Tons	10		
Q	Graded crushed stone (crusher run - 0 to 60mm)	Tons	10		
R	Murram	Tons	10		
S	Hardcore	Tons	10		
T	Redsoil	Tons	10		
U	Reinforcement steel	Kg	100		
V	Sawn timber 100 x 50mm	m	10		
W	Ditto 150 x 50mm	m	10		
X	6mm thick clear glass	m ²	10		
Y	Water	lts	100		
Z	Diesel fuel	lts	10		
	Carried to Collection				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION
Dayworks and Schedule of Rates

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 24				
	DAYWORKS				
	Total Brought Forward from Page No.		Page No. 24/1 24/2		
	TOTAL FOR DAYWORKS CARRIED FORWARD TO SUMMARY OF SECTION NO.24				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Dayworks and Schedule of Rates

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	<u>ELEMENT No 2</u>				
	SCHDEULE OF RATES				
	<u>Rate to material, labour, profit and overheads.</u>				
A	APP roofing felt	m2	1		
B	Masterseal 588 waterproofing	m2	1		
C	150 x 50mm cypress roof timber	m	1		
D	20mm thick blockboard	m2	1		
E	10mm Thick laminated glass	m2	1		
F	Decra roofing tiles	m2	1		
G	Non-slip floor ceramic tiles-400x400mm	m2	1		
H	Ceramic wall tiles-400x400mm	m2	1		
I	Mazeras stone flooring/cladding	m2	1		
J	Njiru natural stone cladding	m2	1		
K	Stone sealant	m2	1		
L	12mm thick toughened glass	m2	1		
M	250 X 25 mm cypress fascia boards	m	1		
N	150mm diameter half round gutter UPVC	m	1		
O	Granito wood tile 200 x 800mm	m2	1		
P	Composite precast concrete hollow block suspended floor construction comprising 380 x 250 x 300mm precast concrete pots at 530mm centres, with 100mm thick class 35 concrete topping ; 150mm wide ribs	m2	1		
	TOTAL FOR SCHEDULE OF RATES CARRIED FORWARD TO SUMMARY OF SECTION NO.24				

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION
Dayworks and Schedule of Rates

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	Section No. 24				
	CIVIL WORKS				
	<u>SECTION SUMMARY- DAYWORKS AND SCHEDULE OF RATES</u>				
1	DAYWORKS	Page	24/3		
2	SCHEDULE OF RATES	Page	24/4		
	Carried to Final Summary				
	Section NO.24				
	DAYWORKS AND SCHEDULE OF RATES				

PRIME COST SUMS

Note:

1. The rates and prices shall be inclusive of VAT at 16%

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION

Prime Cost Sums

ITEM	DESCRIPTION	UNIT	QTTY	RATE	AMOUNT
	SECTION NO. 25				
	<u>ELEMENT NO.1</u>				
	PRIME COST SUMS : NOMINATED SUB CONTRACTORS/NOMINATED SUPPLIERS				
	<u>Furniture and Furnishings</u>				
A	Provide the Prime Cost Sum for furniture and furnishings as per Architect's drawings	Sum	1		40,000,000.00
B	Allow for Profit for main contractor	%			
C	Allow for general ad special attendance	%			
	<u>Window cleaning system</u>				
D	Provide the Prime Cost Sum for window cleaning system	Sum	1		15,000,000.00
E	Allow for Profit for main contractor	%			
F	Allow for general ad special attendance	%			
	Carried to Grand Summary				
	Section No. 25 PRIME COST SUMS			Ksh	

REPUBLIC OF KENYA



PARLIAMENT
OF KENYA

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR

PARLIAMENTARY SERVICE COMMISSION
PARLIAMENTARY JOINT SERVICES

ON LR NO. 28172

TENDER REF NO PJS/012/2021-2022

BILL OF QUANTITIES-ELECTRICAL SERVICES INSTALLATIONS

PROJECT CONSULTANTS

ARPRIM CONSULTANTS

P.O. BOX 12969-00400

NAIROBI, KENYA.

EMPLOYER

PARLIAMENTARY JOINT SERVICES

P.O. BOX 41842-00100

NAIROBI, KENYA.

**CENTRE FOR PARLIAMENTARY STUDIES AND
TRAINING**

**SPECIFICATIONS FOR ELECTRICAL SERVICES
INSTALLATIONS**

PART A	7
ELECTRICAL ENGINEERING SERVICES	7
GENERAL SPECIFICATION	7
1.0 SECTION 1 - GENERAL	8
1. General	8
1.1. Regulation and Standards	8
1.2. Quality of Materials and Manufacturing Standards	8
1.3. Installation Requirements - General and Liaison	9
1.4. Installation and Commissioning	9
1.5. Labelling	9
SECTION 2 H.V. SWITCHGEAR	10
2.0 H.V. SWITCHGEAR	10
2.0.1. General	10
2.0.2. Supply System	10
2.0.3. Type of Switchgear	10
2.0.4. Bus-Bars	10
2.0.5. Extensibility	11
2.0.6. Cable Boxes	11
2.0.7. Special Tropical Finish	11
2.0.8. Labels	11
2.0.9. Relays	12
2.1 Instrument Panels	12
2.2 Test Link Blocks	12
2.3 Small Wiring	12
2.4 Current Transformers	13
2.5 Voltage Transformers	13
2.6 Drawings for Approval	13
2.7 Miscellaneous	14
2.8 D.C. Tripping Equipment	14
SECTION 3- POWER TRANSFORMERS	15
3.1 General	15
3.01 Dry-Type Transformers	15
3.02 Transformer Tests and Inspections	15
3.03 Transformer Tests on Site	16
SECTION - 4	17
L.V. SWITCHBOARD AND GEAR	17
4.01 General	17
4.02 Switchboard Cubicle Construction	17
4.03 Bus-bars	18
4.04 Circuit Breakers	19
4.05 Oil Switches	21
4.06 Air Break Switches	21
4.07 Fuse Switches	21
4.08 Earth Bars	22
4.09 Neutral Bars	22
4.10 Phase Failure Relays	23

4.11	<i>Air Break Switches</i>	23
4.12	<i>Switch Fuses</i>	23
4.13	<i>Cabling</i>	24
4.14	<i>Distribution Boards</i>	24
4.15	<i>Labelling of Switchgear and Distribution Boards</i>	25
4.16	<i>Drawings for Approval</i>	25
	SECTION 5.....	27
	POWER CABLES.....	27
5.01	<i>Paper Insulated Cables</i>	27
5.02	<i>Jointing</i>	27
5.03	<i>PVC Insulated and Sheathed Single Wire Armoured or Unarmoured Cables with Stranded Copper Conductors</i>	28
5.04	<i>PVC Insulated and Sheathed Aluminium Strip Armoured or unarmoured Cables with Solid Aluminium Conductors</i>	28
5.05	<i>Gland for PVC Insulated Armored and PVC Sheathed Cables</i>	29
5.06	<i>Installation</i>	29
5.07	<i>Cable Supports</i>	30
5.08	<i>Cable Identification Discs</i>	31
5.09	<i>Cable Ducts</i>	31
5.10	<i>Terminal Sealing Boxes</i>	32
5.11	<i>Trenching</i>	32
5.12	<i>Testing</i>	33
5.13	<i>Cable Length, Types and Sizes</i>	33
5.14	<i>Mineral Insulated Copper Sheathed Cables</i>	33
	SECTION 6.....	35
	APPROVED WIRING SYSTEMS.....	35
6.01	<i>System A - Cables enclosed in Concealed Steel Screwed Conduit or Trunking</i>	35
6.02	<i>System B - Cables enclosed in Steel Screwed Conduit or Trunking fixed to the surfaces of Walls and Ceilings</i>	35
6.03	<i>System C - PVC Insulated Cables with Insulated Earth Continuity Conductor Enclosed in Concealed Non Metallic Conduit or Trunking</i>	35
6.04	<i>System D - PVC Insulated Cables with Insulated Earth Continuity Conductor enclosed in Non-Metallic Conduit or Trunking fixed to the Surfaces of Walls and Ceilings</i>	35
6.05	<i>System E - Mineral Insulated Copper Sheathed Cables</i>	36
6.06	<i>System F - PVC Insulated and Sheathed Cables, Clipped to the Surface of the Walls and Roof Members or to the Ceilings</i>	36
6.07	<i>System G - PVC Insulated and Sheathed Cables Clipped to Roof Members and Run in Metal or Plastic Conduit Drops Concealed in Walls</i>	36
6.08	<i>System H - PVC Insulated Single Wire Armoured and PVC Sheathed or Paper Insulated Lead Sheathed Single Wire Armoured and Served Cables Laid in Ducts, Trenches and Saddled to walls</i> ..	37
	SECTION 7.....	38
	CONDUITS, TRUNKING AND ASSOCIATED FITTINGS	38
7.01	<i>Steel Conduits - Steel Trunking</i>	38
7.02	<i>Flexible Conduit</i>	40
7.03	<i>Plastic Compound</i>	41
7.04	<i>Telephone Conduit</i>	41
7.05	<i>Television Conduit</i>	41
7.06	<i>Cable Tray</i>	41
7.07	<i>Rising Main Bus-Bars</i>	42

7.08	<i>Under floor Ducting</i>	43
	SECTION 8.....	44
	CABLES IN CONDUIT OR TRUNKING.....	44
8.01	<i>General</i>	44
8.02	<i>PVC Cable in Conduits</i>	44
	SECTION 9.....	46
	TESTING ON SITE.....	46
9.01	<i>Installation Tests</i>	46
9.02	<i>Testing Equipment</i>	46
9.03	<i>Attendance on Other Contractors</i>	46
9.04	<i>Equipment, Plant, Apparatus and Systems</i>	46
	SECTION 10.....	48
	EARTHING.....	48
10.01	<i>Earthing</i>	48
10.01	<i>Earthing System for High Voltage Supply</i>	48
10.02	<i>Earthing System for L.V. Supply</i>	49
10.03	<i>Protective Multiple Earthing</i>	49
10.04	<i>Consumer's Earth</i>	50
10.05	<i>Bonding</i>	50
	SECTION 11.....	51
	INSTALLATION OF LIGHTING FITTINGS	51
11.01	<i>Fixings</i>	51
11.02	<i>Alignment</i>	51
11.03	<i>Enclosures</i>	51
11.04	<i>Earthing of Lighting Fittings</i>	51
11.05	<i>Programme for Erection of Lighting Fittings</i>	51
	SECTION 12.....	52
	LIGHTING AND SINGLE PHASE POWER ACCESSORIES.....	52
12.01	<i>General</i>	52
12.02	<i>Special Accessories</i>	52
	SECTION 13.....	53
	PLANT POWER WIRING.....	53
13.01	<i>General</i>	53
13.02	<i>Power Outlets for Lifts</i>	53
	SECTION 14.....	54
	NON-METALLIC CONDUIT.....	54
14.01	<i>General</i>	54
14.02	<i>Manipulation</i>	54
14.03	<i>Joint of Plain Conduit</i>	54
14.04	<i>Conduit Fittings</i>	54
14.05	<i>Fixing of Conduit</i>	55
14.06	<i>Circular Inspection Boxes</i>	56
14.07	<i>Stopping Plugs</i>	56
14.08	<i>Continuity</i>	56
	PART B	57
	ELECTRICAL ENGINEERING SERVICES	57
	PARTICULAR SPECIFICATION	57

SECTION 1.....	58
PARTICULAR CONDITIONS.....	58
1.01 Location of Site.....	58
1.02 Description of Project.....	58
1.03 Commencement of Works.....	58
1.04 Climatic Conditions.....	58
1.05 Scope of Sub-Contract Works.....	59
1.06 Ordering.....	60
1.07 Builder's Work Requirements.....	60
1.08 Statement of Compliance.....	60
1.09 Storage of Materials.....	60
1.10 Labour Camps.....	60
1.11 Site Visit.....	60
SECTION 2.....	61
INCOMING ELECTRICITY SUPPLIES.....	61
2.01 General.....	61
2.02 Earthing.....	61
2.03 Metering Power Supplies.....	61
2.04 Attendance.....	62
SECTION 3.....	63
MAIN L.V. SWITCHBOARD.....	63
3.01 Scope of Work.....	63
3.02 Contract Drawings.....	63
3.03 Low Voltage Switchboard General Requirements.....	63
3.04 Fuse Switches.....	63
3.05 M.C.C.B.'s.....	64
SECTION 4.....	65
ELECTRICAL DISTRIBUTION SYSTEM.....	65
4.01 Scope of Work.....	65
4.02 Sub-main Cables.....	65
4.03 Distribution Boards and Consumer Units.....	65
4.04.1 Scope of Work.....	66
4.05 Fuse Switches (Loose Equipment).....	66
4.06 Isolator (Loose Equipment).....	66
4.07 Cable Tray.....	67
4.08 Cable Schedule.....	67
4.09 Rising Main Bus bars.....	67
4.10 Fire Barriers.....	67
4.11.0 Power Factor Correction Equipment.....	68
4.11.1 Scope of Works.....	68
SECTION 5.....	69
LIGHTING AND POWER INSTALLATION.....	69
5.01 Scope of Work.....	69
5.02 Wiring System.....	69
5.03 Lighting Luminaries.....	69
5.04 Lighting Switches and Socket Outlets.....	69
5.05 Cooker Control Units.....	69
5.06 Connector Boxes.....	69

5.07	<i>Ramp Lighting</i>	70
5.08	<i>External lighting</i>	70
5.09	<i>Adaptor Boxes</i>	70
5.10	<i>Sub-Main Cables</i>	70
	SECTION 6.....	71
	LIGHTNING PROTECTION SYSTEM.....	71
6.01	<i>Scope of Work</i>	71
6.02	<i>Description of Installation</i>	71
6.03	<i>Bonding of Roof Copper Tapes</i>	71
6.04	<i>Earthing of Lightning Protection System</i>	71
6.05	<i>Earth Continuity Test for Down Conductors</i>	72
	SECTION 7	73
	TELEPHONE/COMMUNICATION DISTRIBUTION SYSTEM	73
7.01	<i>Scope of Works</i>	73
7.02	<i>Distribution System</i>	73
7.03	<i>Wiring System</i>	73
	SECTION 8	75
	FIRE ALARM AND DETECTION SYSTEM.....	75
8.01	<i>Scope of Work</i>	75
8.02	<i>Operation</i>	75
8.03	<i>Wiring System</i>	75
8.04	<i>Battery/Charger Unit</i>	76
8.05	<i>Annunciator Panels</i>	76
8.06	<i>Break Glass Contacts</i>	76
8.07	<i>Alarm Bells</i>	77
8.08	<i>Smoke Detectors</i>	77
8.09	<i>Heat Detectors</i>	77

PART A

ELECTRICAL ENGINEERING SERVICES

GENERAL SPECIFICATION

1.0 SECTION 1 - GENERAL

1. General

This section specified the general requirements for plant, equipment and materials forming part of the Electrical Sub-Contract Works and shall apply except where otherwise specified. The Sub-Contract Works shall comply with the General Specification when read in conjunction with the Particular Specification and any other requirements of the Specification as previously defined.

1.1. Regulation and Standards

The Sub-Contract Works shall comply with the current Kenya Government Electrical Regulations, the current edition of the Institution of Electrical Engineers Regulations for the Electrical Equipment of Buildings, hereinafter referred to as the I.E.E. Regulations, and the Bye-Laws of the Electricity Supply Authority. The Sub-Contract Works shall also comply where applicable to Kenya Standards as published by Kenya Bureau of Standards or current edition IEC (International Electro Technical Commission) and British Standards Codes of Practice where Kenya Standards have not been published.

1.2. Quality of Materials and Manufacturing Standards

Materials and apparatus required for the complete installation as called for in the Particular Specification or Contract Drawings shall be supplied by the Sub-Contractor unless special mention is made otherwise.

Materials or apparatus supplied by others for installation or connection by the Sub-Contractor shall be carefully examined on receipt. Should any defects be noted the Sub-Contractor shall immediately notify the Engineer.

Unless otherwise specified all materials, including equipment, fittings, cables, etc., shall be in new condition and manufactured to appropriate standards of the Kenya Bureau of Standards, the British Standards Institution, the I.E.E. Regulations or other equivalent and approved standards.

Defective equipment or that damaged in course of installation or test shall be replaced or repaired to the approval of the Engineer.

Materials and apparatus supplied by the Sub-Contractor shall be as specified and no variations will be permitted without the written consent of the Engineer. Should any replacement be necessary the Sub-Contractor shall bear the cost of any associates Builder's Work and making good finishes.

1.3. Installation Requirements - General and Liaison

The starting currents of all electric motors and equipment supplied under the Specification shall be limited so as not to exceed the maximum permissible starting currents described in the Electricity Supply Authority's (KPLC) Bye-Laws.

Attention is drawn to the fact that all the Sub-Contractor's work is subject to the Engineer's approval.

1.4. Installation and Commissioning

The Sub-Contractor shall be deemed to have included in the Sub-Contractor Sum for the services of a specialist or manufacturer's engineer or technician to assist in the installation and commissioning of the Sub-Contract Works or any part thereof if the Sub-Contractor has not his own suitable and competent staff available at the site of the works to carry out such functions.

1.5. Labelling

All plant, apparatus, equipment, distribution boards, distribution cases, terminals and cable cores shall be securely and properly labelled to the approval of the Engineer. The labelling shall be such as to show clearly the identification of the item and if applicable its control function and the part of the system controlled.

SECTION 2 H.V. SWITCHGEAR

2.0 H.V. SWITCHGEAR

2.0.1. *General*

The units which together comprise the switchboards are to be provided in accordance with the Contract Drawings and Schedules of equipment.

The switchboards shall be manufactured in accordance with B.S.162 and all equipment and material used in the switchboards is to be in accordance with the appropriate British Standards. The switchboards shall be flush fronted in appearance with the breaker operating mechanism easily accessible but behind the hinged door.

The Sub-Contractor shall allow for the supply of a complete set of Record Drawings relating to the switchboard, made in ink on tracing cloth.

Four sets of instruction manuals are to be provided describing the method of operating the equipment together with instructions for maintenance and adjustment and giving full details of all connections brought out to the Test Link Blocks.

2.0.2. *Supply System*

2.5MVA, 415V, 3 phase, 50Hz, earthed system.

2.0.3. *Type of Switchgear*

The switchgear shall consist of oil circuit breakers or oil switches as indicated on the Contract Drawings. They shall be of the fully interlocked, metal clad, vertical isolation type, incorporating integral earthing facilities manufactured to the current edition of B.S. 5211 and B.S. 5463. Circuit breakers shall be fitted with manually charged spring closing mechanisms.

2.0.4. *Bus-Bars*

The bus-bars for each switchboard may be air insulated provided that all primary circuits in the fixed portion of the units are insulated with Epoxy Resin.

Bus-bars and current transformer joints and connections are to be insulated by epoxy resin shrouds which shall be mechanically jointed, or PVC sleeved and filled with encapsulating compound, otherwise the

switchboard shall be compound insulated. The bus-bars and connections shall be constructed from high conductivity solid copper.

The bus-bars and bus-bar supports shall be arranged to withstand, without damage, the effects of any fault current up to and including the maximum rated breaking capacity of the switchgear.

Bus-bars and connections shall be suitably and adequately colour coded for phase identification.

2.0.5. *Extensibility*

All units shall be so designed and the bus-bars drilled so that further extension units can be added without difficulty. Space and full provision for fitting future units shall be allowed in accordance with the instructions in the Schedule of Equipment.

2.0.6. *Cable Boxes*

Where required, cable boxes manufactured from close grained cast iron to B.S. 2562, Part 1 where applicable, shall be provided suitable for the reception of the cable specified.

2.0.7. *Special Tropical Finish*

The switchgear shall be designed for use in the tropics and the following requirements shall be incorporated:

- a) All parts of the switchgear shall be totally enclosed and enclosures shall be vermin proof.
 - b) Gaskets shall be Neoprene or similar material.
- 2.1.2 All steelwork shall be treated with a phosphoric base etching primer containing a resin bond and finished with two coats of paint.
- 2.1.3 The interior of all gear not having oil, compound or other insulation, and all exposed current carrying metalwork (other than contact faces) shall be sprayed with an approved type of bakelite varnish.
The final coat of paint shall be of a colour taken from B.S. 3810 or B.S. 4800 to be chosen by the Engineer.

2.0.8. *Labels*

Each switch shall have a designation label of Traffolyte with 10mm high black lettering on a white background. They shall be screwed to the equipment, adhesive only is not acceptable. A small similar designation label shall also be fixed to the rear of each fixed portion.

2.0.9. *Relays*

Protection relays shall be of the type and number listed in the schedule of requirements for HV switchgear in the Particular Specification.

All relays shall be flush mounted, and where required, shall be provided with additional contacts for remote indication etc., Bezels shall be finished in black gloss.

The relays shall have their secondary connections brought out to studs on the rear and firmly secured by suitable washers, nuts and locknuts. The relays shall have hand reset features.

2.0.9.1. Instrumentation

Instruments shall be fitted on the switchboard as shown on the drawings and in the schedules of requirements for HV switchgear in the Particular Specification.

Ammeters shall be MICS 100mm square dial flush mounting pattern with rotary selection switch.

Voltmeters shall be MICS 100mm square dial flush mounting pattern with rotary selector switch.

The construction of the instruments shall be in accordance with B.S. 89 and shall be of industrial grade.

2.1 Instrument Panels

Instrument panels shall be mounted at the same height on each unit and have suitably hinged front panels.

2.2 Test Link Blocks

Test link blocks shall be connected to all protection and instrumentation current transformer connections.

2.3 Small Wiring

All small wiring necessary for connecting the instruments, relays and other devices shall be included and shall have a conductor size of not less than 7/.085mm with a thermoplastic flame retarding type of insulation.

The wiring shall be distinctly colored and marked with ferrules of an approved type at each end.

All wiring within each switchboard, not installed in conduits, shall be neatly laced and cleated to the panel structure of each switchboard and its auxiliary equipment.

Where wiring passes through a hole in the metal work, thermoplastic grommets shall be used and in no case shall cables be unprotected where they come into contact with the edge of a piece of metal work.

2.4 Current Transformers

Separate current transformers shall be provided for protection and instrumentation.

Current transformers shall have a secondary rating of 5 amps. The primary currents are indicated on the drawings. Current transformers shall have overcurrent factors suitable for the prospective short circuit current of the system. Current transformers shall have overcurrent factors suitable for the respective short circuit current of the system. Current transformers required for operating relays shall have a one-second rating as defined in B.S. 3938, be suitable for the characteristics of the relay concerned and have a minimum output of 15 VA.

Current transformers shall be of the bar primary or wound primary type according to the transformer ratio with jointress ring core of either hot or cold rolled silicon iron.

2.5 Voltage Transformers

Voltage transformers shall be of the dry type with hinge isolation and in accordance with B.S. 3941. The rated output and accuracy offered should be stated. Cartridge type fuses shall be provided for protection of both primary and secondary windings.

2.6 Drawings for Approval

The following drawings shall be submitted for each switchboard for approval as soon as possible after receipt of instructions from the Engineers to proceed:

Plans and elevations showing position of instruments, relays, current transformers, voltage transformers, fuses, cable boxes and other accessories. Foundation plan showing fixing bolt centres, cables centres and other relevant dimensions.

- i) Wiring and connection diagrams.
- i i) Schematic diagrams.

Three copies of each drawing as finally approved shall be supplied to the Engineer.

In addition, the Sub-Contractor shall provide any other drawings or information required by the Engineer in order that the Engineer may satisfy himself as to the design of the plant. Manufacture shall not be commenced until all relevant drawings have been approved by the Engineer.

2.7 Miscellaneous

A tinned copper bonding bar shall be provided for the full length of the switchboard to which each unit shall be bonded.

A wall chart mounted on metal, with instructions for the treatment of electric shock, shall be supplied and fixed in the switch rooms.

Six in number heavy brass non-interchangeable padlocks, for locking switchgear, spout covers and operating mechanisms, shall be provided each with two keys.

A framed diagram showing clearly the layout of the high voltage distribution system shall be provided and fixed in the switch rooms.

2.8 D.C. Tripping Equipment

A nickel cadmium type battery adequately rated to operate the D.C. tripping circuit of the breakers shall be supplied with each switchboard. The battery shall be complete with floor mounting stand and a suitable trickle charger having a 240-volt single phase input.

From the output terminals of the battery unit wiring shall be taken to the trip terminals located at the rear of the switchboard.

SECTION 3- POWER TRANSFORMERS

3.1 General

Power transformers shall be dry type and of voltage ratio and rating called for in the Specification.

There will be 2No. 1.5MVA, 11kV/415V indoor power transformers.

3.01 Dry-Type Transformers

Dry-type transformers shall have Class AN cooling, windings vector group DY.11, insulation Class 'C'. The arrangements and connection of windings, tap-changing, loading and terminal boxes shall be as previously detailed in Clause

Temperature rise shall not exceed that listed in Table 13 of B.S.171 with the reduction factor listed in Table 15 applied for the climatic conditions described in the Specification.

The transformer shall be complete with the following fittings:-

- a) Rating plate,
- b) Terminal marking plate,
- c) Lifting lugs
- d) Earthing terminal for frame.

3.02 Transformer Tests and Inspections

The Engineer shall be invited to inspect the transformers at the manufacturer's works during the erection of cores and windings, and to witness final tests when the transformers are fully assembled. It will be the Sub-Contractor's responsibility to inform the Engineer and give reasonable notice of the manufacturer's intention to carry out the above assemblies and tests. The tests shall be as described in clause 1802 of B.S. 171:1959.

The Sub-Contractor shall submit three copies of all relevant test certificates (B.S. 171 Clause 1802(a)) to the Engineer for approval prior to shipment of the transformers. Certificates of type tests (B.S. 171, Clause 1802 (b)) will be

acceptable subject to the Engineer's approval except where specified elsewhere in the specification.

3.03 Transformer Tests on Site

The Sub-Contractor shall carry out all necessary tests to the satisfaction of the Engineer to ensure that the transformer has not been damaged in transit and is ready for service, such tests shall be made before setting to work and shall include but not limited to: -

Continuity and polarity tests,

Insulation resistance tests,

Oil moisture and acidity tests

SECTION - 4

L.V. SWITCHBOARD AND GEAR

4.01 General

The switch gear shall be designed throughout to ensure safety during operation, inspection, cleaning and Maintenance and shall be so arranged as to minimize the risk of fire arising and spreading.

The switchboard shall be manufactured in accordance with B.S. 162 which coordinates the requirements for electric power switch gear and associated apparatus.

It is not intended that B.S. 162 should cover the requirements for specific apparatus for which separate British Standards exist. All equipment and material used in the switchboard shall be in accordance with the appropriate British Standard.

4.02 Switchboard Cubicle Construction

The switchboard shall be a cubicle type of flat front, back connected, sectional, painted, all steel construction of neat appearance.

It shall be floor mounted and have ring bolts, lifting lugs or other approved means of transporting and lifting.

Each switchboard section shall be completed, fully wired and checked out at the factory and shall require a minimum of installation work at the Site of the Works. Modula construction shall be used wherever practicable and provision shall be made for simplifying servicing, replacement and maintenance throughout without major dismantling.

The switchboard shall be constructed from not less than 10 gauge welded bright mild steel for framework and structural sections and 16 gauge for doors and panels which shall be adequately stiffened by folding or welded stiffeners. The switchboard base shall be of heavy gauge tube or structural section to allow moving on rollers. All doors shall be properly stiffened and fitted with heavily cadmium plated concealed hinges and flush catches.

Removable stiffened steel covers shall be provided elsewhere on the switchboard for full access. All doors and covers shall be fitted with cemented resilient gasket seals to provide a dust proof enclosure. All hardware and

fastening shall be heavily cadmium plated. No self-tapping screws shall be used.

All steelwork shall be clean and free of burrs, scale and blemishes, with all raw edges hidden and shall be finished with a rust inhibiting treatment one primer or undercoat and final coat of first quality sprayed baking enamel the colour of which shall be to approval.

The switchboard shall be arranged to provide the maximum of safety to personnel and equipment. All electrical wiring and bus-bars shall be completely enclosed. Closure panels, isolating and insulating barriers and interlocks shall be provided as required for maximum safeguard. All fuse switches shall be capable of being padlocked in the 'OFF' and the 'ON' positions.

Adequate supports shall be provided for all bus-bars and wiring and incoming and outgoing cables shall be provided with glands, cable boxes and other necessary terminations in a cable area separate from the bus bars. All switches shall be operable from floor level, all fuses shall be within 2000mm of the floor and flush mounted indicating meters within 1650mm. The main switchboard in 11/415KV Substation shall be IP-32 Form-3B complete with 2No 2000A Incomer MCCB, 2No 1000A Outgoing breakers – to Rising Busbars in Conference and Accommodation and 2 No 800A Outgoing breakers to PFC, 1 No 400A Outgoing breakers to Administration board, 1 No 630A Outgoing breakers to common area and 1 No 800A Outgoing breakers to essential loads panel.

Where spaces on the switchboard are provided for future circuit components to be installed, as shown on the drawings, all ancillary parts shall be provided and installed so that future components may be installed and connected in the least time possible. Full safety precautions shall be provided with all such spaces.

The mild steel angle or channel forming the bottom rear edge of the switchboard shall be made up in sections and bolted into position such that any one section may be removed to facilitate installation of cables.

4.03 Bus-bars

All bus-bars shall be of high conductivity copper and shall be manufactured and tested in accordance with B.S. 158 and B.S. 159. They shall be mounted fully enclosed within the main enclosure of the switchboard in separate

chambers in accordance with B.S. 162. The bus-bars shall be fully separated from the incoming and out-going cable areas.

Except for instruments, potential or current connections, which shall be clamped in position and be of minimum length, no circuit wiring shall be within the bus-bar chamber.

Bus-bars shall be sheathed in approved insulating material, in their respective phase colours, and secondary insulation shall be provided where bus-bars pass through supports to prevent tracing paths. Supports shall be such that the required clearances between phases, neutral and earth are maintained under rated continuous current and under fault conditions.

Provisions shall be made for expansion and contraction of the bus-bars and connections, with variations in temperature.

Interconnections between bus-bars and switchgear shall be of minimum length, properly insulated and rigidly supported.

All contact areas of the bus-bar and the connections fastened to the bus-bars shall be heavily silver-plated. Joints and connections shall be rigidly made with clamps and high tensile steel bolts and nuts used with spring washers to maintain uniform pressure and flat washers to prevent cupping. Ready access to all joints and connections shall be provided.

4.04 Circuit Breakers

Where oil circuit breakers are called for on the drawings, they shall be suitable for the current rating and system conditions indicated and shall be in strict accordance with B.S. 116. They shall have a minimum breaking capacity of 26 MVA at 415V and shall carry a Certificate of Rating to B.S. 5311 issued by any approved testing Authority.

Where air circuit breakers are called for on the drawings, they shall be suitable for the current rating and system conditions indicated and shall be in strict accordance with B.S. 5311. They shall have a minimum breaking capacity of 31 MVA at 415V and shall carry a Certificate of Rating to B.S. 5311 issued by an approved testing Authority.

The main switchboard in 11/415KV Substation shall be IP-32 Form-3B complete with 2No 2000A Incomer MCCB, 2No 1000A Outgoing breakers – to Rising Busbars in Conference and Accommodation and 2 No 800A Outgoing breakers to PFC, 1 No 400A Outgoing breakers to Administration board, 1 No

630A Outgoing breakers to common area and 1 No 800A Outgoing breakers to essential loads panel.

Each circuit breaker shall be fitted with telescopic rails to allow the breaker to be withdrawn clear of the cubicle and a racking mechanism. Safety shutters shall be provided to protect against accidental contact with the stationary isolating contacts when the breaker is withdrawn.

Interlocks shall be provided to ensure that: -

- a. The cubicle door is closed and the slide rails locked before the circuit breaker can be racked in.
- b. The trip button must be depressed before the racking mechanism can be operated in either direction.
- c. The circuit breaker cannot be pushed into the ratchet in position without the use of the racking mechanism.
- d. The cubicle cannot be opened when the circuit breaker is in the racked in or fully racked out position.
- e. The circuit breaker can be operated only when it is in the fully racked in or fully racked out position.

The circuit breakers shall have a stored energy, single shot, trip free, closing mechanism.

Inverse definite minimum time lag over current relay protection shall be provided on each circuit breaker.

Tripping under fault conditions shall be effected by a 30V D.C. trip coil energized by a 30V nickel cadmium battery and charger set. The battery and its trickle charger shall be mounted in a naturally ventilated, floor mounted, steel cubicle and located as shown on the drawings. This battery shall be suitable for tripping two low voltage circuit breakers. A manual trip push button which shall be independent of the operator's speed of operation shall also be provided.

The trip coil latching lever and the roller mechanism shall be made from anti corrosive metal.

The contacts shall be silver plated, shrouded and renewable. Barriers shall be provided between phases and recessed into the base.

A mechanically operated semaphore shall be used to indicate the condition the circuit breaker using the words 'ON' AND 'OFF'.

Each circuit breaker shall be provided with the facility of locking the breaker in the 'OFF' position.

4.05 Oil Switches

Oil switches shall be identical to the oil circuit breakers, B.S. 5311 except that tripping devices are not required. Means of locking the switches in the 'OFF' position shall be provided.

4.06 Air Break Switches

Air break switches shall be suitable for the system conditions, indicated and shall be in strict accordance with B.S. 5419. Class II switches. Means of locking the switches in the 'OFF' position shall be provided.

4.07 Fuse Switches

All fused switches shall be supplied and installed complete with Class Q1 H.R.C. Cartridge Fuse Links complying with B.S. 88, as shown on the drawings and shall be contained in metal clad, dust proof, gasket sealed individual enclosures with non-detachable steel operating handles which shall be capable of being locked in either the 'ON' or the 'OFF' position.

The fuse switch units shall comply with B.S. 5419 and shall be withdrawable.

The fuse switch units shall have fault rating at least equal to the fault rating of the switchboard in which they are to be installed.

The fuse switch units shall be of fast make break design suitable for on load operation and shall be arranged operation of the switch when the cover is open and to prevent opening of the cover when the switch is in the 'ON' position. The H.R.C. fuse links shall be carried on the moving contact mechanism and shall be isolated from the line and load contacts when in the 'OFF' position. In the 'ON' position a barrier shall be interposed between the fuse links.

The switch contacts shall be separately and fully shrouded and shall be renewable.

Moving or fixed indicators shall use the words 'ON' and 'OFF' to indicate the fused switch condition. Indicators shall be mechanically locked with the moving contact assembly and shall operate in such a manner that all phases shall be broken before the 'OFF' position is indicated.

4.08 Earth Bars

A high conductivity copper earth bar of not less than 50mm x 6mm section, adequately rated for the anticipated earth fault current, shall be installed the full length of the switchboard in the outgoing cable area within the switchboard enclosure.

Connection to the earth bar shall be made with approved cable lugs and high tensile steel nuts and bolts with washers as specified for the phase bus-bars.

The points of contacts on the earth bars shall be silver plated.

4.09 Neutral Bars

A high conductivity copper neutral bar adequately rated and supported for normal and fault conditions shall be installed in the outgoing cable area in the switchboard enclosure. This bar shall be mounted on insulators and shall be divided into sections according to the design of the switchboard. The sections shall be connected by copper links double bolted to each section.

Voltmeters shall be MICS 150mm square dial, flush mounting pattern with rotary selector switch enabling phase to phase and phase to neutral volts to be read.

Voltmeters shall be protected by means of cartridge fuses, category of duty A.C. 46 and fusing factor, 1.5. The construction of the instruments shall be in accordance with B.S. 89 and shall be of industrial grade.

The current transformers shall be of an approved type to B.S. 3938.

The Sub-Contractor shall agree with the Engineer, the arrangement of the indicating instruments, their scale deflections C.T. ratios and all information that

the switchboard manufacturers may require, prior to manufacture of the switchboard.

4.10 Phase Failure Relays

Where the requirement is shown on the Drawings phase failure relays shall be installed for the operation of the emergency lighting.

Phase failure relays shall be connected across each phase and neutral of the supplies as indicated on the distribution diagram.

Relays shall be protected by means of cartridge fuses, category of duty A.C. 46 and fusing factor 1.5.

In addition, test buttons shall be provided. The test buttons shall be connected in series with each phase failure relay coil so that when any one of the test buttons is operated the emergency lighting shall come on automatically.

Test buttons and relays shall be housed in the instrument section of the switchboard.

4.11 Air Break Switches

All individually mounted air-break switches shall be of 660 volt metal clad type, single pole and neutral, or triple pole and neutral as required, fitted with interlocking handles so that the cases cannot be opened when the handle is in the 'ON' position. All insulating material employed in the construction must be of non-hygroscopic type and to the approval of the Engineer.

The construction and performance of the airbreak switch shall be in accordance with B.S.5419 : Parts 1 and 2.

4.12 Switch Fuses

All individually mounted switch fuses shall be of the metal clad type, the number of poles with or without neutral, as required, fitted with interlocking handles so that the case cannot be opened when the handle is in the 'ON' position. All insulating material employed in the construction must be of non-hygroscopic type and to the Engineer's approval.

The construction and performance of the switch fuses shall be in accordance with the relevant British Standard indicated below.

- i) Units rated not in excess of 100 amps and for a system voltage not in excess of 250 volts to earth shall be in accordance with B.S. 5419 unless specifically amended by the Engineer.
- ii) Units rated in excess of 100 amps and for a system voltage not in excess of 380 volts to earth shall be in accordance with B.S. 5419.

Fuses shall be of the cartridge type, to B.S. 88 category A.C. 46, Class Q1 and fusing factor 1.5 graded to suit the loads carried.

Sub-contractor's attention is drawn to the fact that all fusing in single phase circuits shall be on the "Single pole" principle with solid link in the neutral unless otherwise noted.

4.13 Cabling

A cabling zone clear of busbars, fused switch and circuit breaker chamber, etc., shall be provided in such a manner to give minimum difficulty in connecting submain cables entering the switchboard for connection to fuses switch units or circuit breakers. The cabling zone shall be fully insulated from any live metal part so that future cabling and alterations can be carried out in complete safety without the necessity of shutting down the complete switchboard.

4.14 Distribution Boards

Distribution boards shall be clad, surface or recessed pattern with the number of ways, rating and phase arrangement (single or three phase) indicated on the drawings. Cases shall be zinc coated sheet steel of substantial construction with hinged lids fitted with foam rubber gasket, enamelled finish. Where called for in the specification the cases shall be provided with locks. For ratings of 60 amp. and over detachable drilling plates and soldering lugs for incoming cable terminations shall be provided.

Where the requirement for fuses is indicated on the Contract Drawing the Distribution Boards shall be fitted with the high quality porcelain fuse carriers and bases, removable insulated shields to provide adequate protection against accidental contact with live metal, and circuit indicating labels fixed inside the cover.

The Distribution Boards shall be complete with HRC fuses to B.S. 88 1952, category 440 volts, A.C.5.

Where the requirement for miniature circuit breakers is indicated on the Contract Drawings, the Distribution Boards shall be fitted with moulded thermoplastic units of the combined thermal overload and magnetic short circuit

tripping type to B.S. 3871, Part 1. MCB's of all ratings shall have a minimum short circuit current breaking capacity of 3,000 amps.

Where the prospective fault current exceeds 2500 amps. or where specified, careful consideration shall be given to back-up protection or the installation of miniature circuit breakers of a short circuit capacity in excess of 300 amps. Although short circuit calculations were carried out when the Contract Drawings were prepared, the Sub-Contractor is advised to make his own calculations and assure himself that the prospective fault currents at each protection level does not exceed the short circuit capability of the switch or distribution gear he intends to install as it is his responsibility to sign the appropriate declaration in accordance with the I.E.E. Regulations.

4.15 Labelling of Switchgear and Distribution Boards

All switchgear shall have engraved labels indicating the services fed from them. The inscription shall be in white 10mm. high letters on black 'Traffolite' sheet or equal and shall be fixed on or adjacent to the apparatus by screws or rivets.

Each Distribution Board shall bear a number or inscription as called for on the Contract Drawings which shall correspond to that shown on the Record Drawings. The circuits fed from each Distribution Board shall be marked on a card or identification plate fixed to the inside of the Board or where provided for. This information must include the outlets (with cross reference to the reference numbers on Contract Drawings) fed from each fuseway or MCB and the size of the fuse or circuit breaker rating.

4.16 Drawings for Approval

The following drawings shall be submitted for L.V. each switchboard for approval as soon as possible after receipt of instructions from the Engineer to proceed: -

- i) Plans and elevations showing position of instruments relays, current transformers, voltage transformers, fuses, cable boxes and other accessories.
- ii) Foundation plan showing fixing bolt centres, cables centres and other relevant Dimensions.
- iii) Wiring and connection diagrams.
- iv) Schematic diagrams.

The copies of each drawing as finally approved shall be supplied to the Engineer. In addition, the Sub-Contractor shall provide any other drawings or information required by the Engineer in order that the Engineer may satisfy himself as to the design of the plant. Manufacture shall not be commenced until all relevant drawings have been approved by the Engineer.

SECTION 5

POWER CABLES

5.01 Paper Insulated Cables

These shall be 1100 volt, 3300 volt, 6600 volt, or 11000 volt grade, according to operating voltage and manufactured and tested in accordance with B.S. 6480 for cables with copper conductors.

E.H.V. cables shall be suitable for operation on an earth system, and shall be of the belted type.

Multi core cables shall be paper insulated, lead sheathed, single wire armoured and served with hesian or PVC or left bright as indicated on the diagram of distribution. Single core cables shall be lead sheathed and served. All paper insulated cables shall be of the fully impregnated non-draining type.

Sizes of cables shall be in accordance with the details given on the Contract Drawings.

5.02 Jointing

Where possible the core of the paper insulated cable shall be taken direct to the terminal of the apparatus. The conductor shall be sweated into a cast pattern cable socket that has been drilled to receive the conductor without excessive clearance. A cable spreader box shall be fitted to and below the apparatus and filled with compound after the cables have been installed. Alternatively, a system of compression jointing, approved by the Engineer may be employed. All cables tails shall be taped with double lapped Empire tape and after grade insulating varnish. VRL/PVC tails shall not be fitted without the approval of the Engineer in writing. If such approval is given the tails shall be of the same cross section as the PILC cable cores. The entire responsibility for the work involved in measuring, proper cutting, jointing and sealing paper insulated cables shall be borne by the Sub-Contractor who shall employ fully qualified, certified and experienced jointers for this work. This applies particularly to the jointers working on E.H.V. jointing.

Whenever a paper insulated cable is cut prior to jointing the joint shall be commenced forthwith and completed without interruption. All necessary precautions shall be taken against the ingress of moisture and impurities during the preparation of the joint. Should the cable be cut and circumstances prevent

a joint being made the ends shall be suitably sealed by means of plumbers lead caps pending the completion of the jointing work. The seals of the cables must not be removed until all preparations for jointing are complete and adequate protection from the weather arranged by the Sub-Contractor.

Before rejoining cable ends shall be tested from moisture content in an approved manner. If any moisture is discovered the wet cable or cables shall be cut out.

Care shall be taken when making off cable ends to phase out the cores to agree with the transformer terminals. No cross overs will be permitted in the leads. Phase colours shall be clearly indicated at all points of connections and shall comply with B.S. 158, Table I.

It shall be ensured that all times straight through joints are from an A end to a Z end. Under no circumstances will core cross overs resulting from joints of the same end of the cable be permitted.

5.03 PVC Insulated and Sheathed Single Wire Armoured or Unarmoured Cables with Stranded Copper Conductors

PVC insulated, single wire armoured and PVC sheathed multi core cable shall be 660/1000 volt grade, manufactured in accordance with B.S. 6346.

The cables shall be sized to comply with the current edition of the I.E.E. Regulations except where specific sizes of cables are shown on the Contract Drawings or detailed in other sections of the Specification.

5.04 PVC Insulated and Sheathed Aluminium Strip Armoured or unarmoured Cables with Solid Aluminium Conductors

PVC insulated, aluminium strip armoured and PVC sheathed multicore cables shall be 660/1000 volt grade, manufactured in accordance with B.S. 6346.

The cables shall be sized to comply with the current edition of the I.E.E. Regulations, except where specific sizes of cables are shown on the Contract Drawings or detailed in other sections of the Specification.

The cable cores shall be identified in accordance with B.S. 6346.

An approved system of compression terminations secured to the conductor by indentation made with a special dies and a portable hydraulic compressor as recommended by the cable manufacturer shall be used.

Alternatively, in the appropriate conductor sizes and, where tunnel type terminals are used, connection may be made by means of "Swage" process whereby the shape of the conductor end is rounded to fit the terminal.

To eliminate the possibility of damage to cables due to thermal expansion, allowance for movement shall be made by the introduction of a bend or set in each core adjacent to the terminal.

Aluminium armour may be used as the earth continuity conductor where the Cross section is adequate for the purpose, but under no other circumstances shall the armour be used as a neutral conductor.

5.05 Gland for PVC Insulated Armored and PVC Sheathed Cables

The cables shall be terminated on a mechanical type cable gland. The glands shall be complete with armouring clamp suitable for bonding the armouring to equipment by means of an earth continuity conductor of adequate cross section and the bend shall be carried out at the time of making the joint. PVC shrouds shall be fitted over terminal cable gland and clamp.

5.06 Installation

Cable routes were indicated on the Contract Drawings for tender purposes only. The exact final routing shall be agreed with the Engineer.

All work except Builders Work shall be carried out by the Sub-Contractor, who shall include for the supply and installation of all jointing material, cable supports, steel racking and making all the necessary cable joints. The cable shall be installed and tested in strict accordance with the appropriate clauses of the current edition of the I.E.E. Regulations, the Factories Act, B.S. 6480 - Paper Insulated cables, and B.S. 6346 - PVC Insulated Cables.

Cables shall at all times be handled with care and every effort made to avoid damage. Unloading, rolling to position and mounting of cable drums shall be carried out efficiently and carefully in the recognised manner and cable shall be pulled from the top of the drum and twisting shall at all times be avoided.

Adequate numbers of drum jacks, rollers and other handling accessories shall be used and make shift arrangements will not be permitted. In all cases care shall not be fragged over loose earth, concrete or any surface but shall be adequately supported on rollers or manhandled into position.

The Sub-Contractor shall take particular care to avoid damage to other services which may run adjacent to or across the route of the cable being installed. The Sub-Contractor shall take particular care to avoid damage to other services which may run adjacent to or across the route of the cable being installed.

Cables shall be installed with a minimum of 300mm clearance from any equipment or pipework including lagging associated with other services. Where this condition is unavoidable or difficult to maintain, the Engineer shall be informed prior to the installation being commenced, otherwise the Sub-Contractor may be called upon to divert or adjust the route of any cable to the Engineer's satisfaction.

Cables passing through structural slabs shall be tightly wrapped with asbestos tape and grouted in. A hard wood surround below shaped to suite the cables passing through shall be fitted below the slab. Where cables are run vertical heavy gauge sheath metal guards shall be supplied and fixed to the wall. The casing shall be fixed from floor level to the underneath side of the appropriate and dividing box or to a height of 1.5m above floor level.

Detailed drawings showing dimensions and method of manufacture of the cable guards shall be submitted for the approval of the Engineer.

All cables shall be firmly and adequately supported from cable hangers for the whole of their length except when they are run through stoneware or pitch fibre pipes or are buried directly in the ground.

Continuity, phasing and insulation tests shall be carried out and the record of all tests shall be sent to the Engineer within 7 days of the cables being installed and jointed.

5.07 Cable Supports

Where cables run through service ducts or cable trenches they shall be fixed by means of purpose made cable hangers which shall be of the Unistrut pattern or equal and approved. Hangers shall be of non-ferrous metal or of steel and shall be treated with one coat of zinc primer and two coats of anti-corrosive paint and shall be suitable for horizontal and vertical mounting, either cased in, or secured to concrete structure using such brackets and adapters as are available from the manufacturers.

Hangers for the support of the cables shall be spaced according to the current edition of the I.E.E. Regulations, Table B.2M or to the manufacturers recommendations as appropriate. The Sub-Contractor shall take particular care to avoid sagging of stress on any cable by wrong positioning or inadequately spaced hangers. Single and multiway cleats shall be of cast alloy, interlocking pattern, for mounting either on the steel channels or directly to concrete structure in the case of single way cleats.

The sizes of cleats shall be selected such that all cleats can be tightened down without exerting undue pressure or strain on the cables.

In the case of vertical cables the cleats shall be so designed and of sufficient number to grip the cable firmly to prevent creeping. No cable shall be run without fixing and all cable hangers and racks shall be approved by the Engineer before installation.

Where cable routes are subject to numerous changes in level and direction, additional cable hangers shall be provided to satisfactorily negotiate all such obstructions. Where cables are spaced some distance from a supporting services, the cable racks shall be separately bolted to additional lengths of channel section which in turn shall be fixed to brackets bolted and fixed into the structure.

5.08 Cable Identification Discs

Identification discs shall be supplied for cables installed within buildings and attached with galvanised wire to each cable at intervals not greater than 12m and at all conspicuous positions such as within cable trenches, manholes, and at all cable terminations.

Discs shall be machine engraved from non-deteriorating black traffolite or similar material displaying white engraved indicating the design voltage, the description of load, and the number of cross sectional area of the cores. The characters shall not be less than 3mm high and shall be clearly legible.

5.09 Cable Ducts

The Sub-Contractor shall provide and lay asbestos cement or pitch fibre cable ducts under roadways or concrete walkways under which cables are to be routed. The Main Contractor will supply and install ducts where required in the footings of buildings, but it will be the Sub-Contractor's responsibility to provide accurate details to the Main Contractor of the required positions of these ducts, and to ascertain that they are laid to the correct falls. After the installation of cables all ducts shall be adequately sealed to restrict the ingress of moisture.

The number of ducts to be provided shall be as follows:-

1 cable	-	2 ducts
2 cables	-	3 ducts
3 cables	-	4 ducts
4 or 5 cables	-	6 ducts
6, 7 or 8 cables	-	9 ducts

All cable ducts entering or within buildings including spare ways, shall be sealed at each end with Densoplast or other approved sealing substance to the satisfaction of the Engineer.

5.10 Terminal Sealing Boxes

All sealing boxes shall be of an approved make and design. The casting shall be of the split type secured together by bolts and nuts and treated inside and out with a suitable preservation compound and shall be complete with brass wiping gland. The castings shall be made of close grounded cast iron free from all holes and flaws. The halves of the casting shall be machined and so arranged to form an effective seal.

The box shall be provided with an external armour clamp. The lead sheathing of the cable shall be firmly secured to the interior of the box by clamping and where necessary by lead packing to form an additional support for the cable.

The lead sheathing shall be plumbed to the brass wiping gland and the armouring neatly fixed by means of binding wire and the external clamp. The Sub-Contractor shall ensure that the lead sheath and wire armouring is efficiently bonded to the metal parts of the apparatus served, with 300mm x 10mm copper tape. This bond shall be fitted at the time the joint is made.

An adequate compound filling gland shall be provided on each box and shall be so placed that the compound can be poured when the sealing end box is bolted into position.

Sealing compound shall be a blend of natural bitumen base containing no coal tar derivatives of any kind and having no deleterious action whatever on the materials used in cable manufacture.

The compound shall be in accordance with B.S. 1858.

5.11 Trenching

Trenching and backfilling will be carried out by the Main Contractor, but the Sub-Contractor shall be responsible for marking out the cable routes and for the supervision of the backfilling in so far as the prevention of damage to the cables in this process is concerned.

Cables in trenches shall be laid at a minimum depth of 600mm for L.V. cables and 700mm for 11KV cables and shall be on a 75mm pad of shift soil or sand and a further 75mm shall be added before placing cable covers in position. Where laid in

trenches the cables shall be completely protected by inter-locking concrete or other approved cable covers indelibly marked "DANGER, HATARI".

Cable marker posts fabricated in precast concrete, shall be installed at each cable entry into the building, each change of direction, each road or pathway crossing and throughout the length of the cable at intervals not exceeding 40m.

The marker posts shall indicate the voltage, depth and distance from the face of post of each cable installed.

Marker posts shall be provided at the position of all underground, through or tee joints and shall, in addition, to those functions detailed above, indicate the type of joint. The position of all marker posts shall be agreed with the Engineer before installation.

5.12 Testing

Before backfilling trenches and subsequent to all terminal jointing having been completed, H.V. cables shall be tested in accordance with B.S. 6480, 1966. L.V. cables shall be subjected to all insulation test at pressure of 1000 volts between cores and to earth and the results of these tests shall be recorded and communicated to the Engineer.

5.13 Cable Length, Types and Sizes

The Sub-Contractor shall be deemed to have allowed in the Sub-Contract Sum for supplying sufficient cable lengths of each type and size to complete the system and for making allowances for any additional lengths for cutting and waste.

5.14 Mineral Insulated Copper Sheathed Cables

Mineral insulated copper sheathed cables shall be manufactured in accordance with B.S. 6207 by an approved manufacturer. Where installed in corrosive situations, they shall be PVC sheathed. No cable shall have conductors less than 1.5mm² cross section.

All main and sub-main cables shall be sized as shown on the Contract Drawings.

All final sub-circuit and control cables shall be sized in accordance with the current edition of the I.E.E. Regulations unless specifically noted on the Contract Drawings or the Specification.

All mineral insulated copper sheathed cable glands shall be of the same manufacture as the cable and shall be of the compression type.

The choice of cable seal type shall be based on the manufacturer recommendation for the particular application.

In areas where a flameproof installation is specified, the glands shall be of flame proof type.

The cable glands and seals for PVC covered mineral insulated copper sheathed cables shall be of the same type as those specified in the preceding paragraph. They shall, however, be fitted with rigid impact resistant hoods and shall be filled with plastic compound as used for sealing the 44°C cable seals.

Connection of mineral insulated copper sheathed cables of 4mm² cross section and larger to apparatus shall in general be by means of cone grip type cable lugs. At a termination, each core shall be identified by colour tapes or sleeves. Where this is not practicable, the Sub-Contractor shall advise the Engineer in writing and shall obtain his decision regarding the type of connection to be provided.

Where MICS cables are fixed direct to the structure of the building, the fixings shall be by means of copper saddles, brass screws and rawl plugs.

Where MICS cables are fixed to cable tray the fixing shall be by means of copper saddles and brass bolts and nuts.

PVC covered copper saddles shall be used with PVC covered MICS cables.

Under no circumstances shall bare MICS cables be fixed to galvanised steel cable tray, galvanised steel brackets or galvanised structural steelwork.

Bare MICS cables shall only be fixed direct to painted structural steelwork and brackets or to painted PVC/Plastic coated steel cable trays as specified later.

All MICS cable fixings shall be installed 75mm either side of a fitting, accessory or right angle bend and subsequently spaced in accordance with the current edition of the I.E.E. Regulations.

All persons employed to make terminations on MICS cables shall have attended a course of instruction approved by the Engineer. Prior to commencing work, they shall demonstrate to the Engineer their ability to make a satisfactory seal. The greatest care shall be taken at all times when terminating MICS cables and insulation tests shall be performed 24 hours after the cable has been sealed.

Where single core MICS cables are used, all necessary precautions shall be taken to prevent hysteresis and eddy currents.

Ferrous plates or structures through which the cables pass shall be slotted and brass glands and sockets shall be used.

SECTION 6

APPROVED WIRING SYSTEMS

The system of wiring has been specified in the BoQ and shall be one or more of the following systems: -

6.01 System A - Cables enclosed in Concealed Steel Screwed Conduit or Trunking

The wiring shall be carried out in an approved type of single core, plastic insulated cable, enclosed in steel screwed conduit or trunking mechanically and electrically continuous throughout.

Conduit shall be buried in the wall and floors of the building, and either run in roof space or buried in structural slabs.

6.02 System B - Cables enclosed in Steel Screwed Conduit or Trunking fixed to the surfaces of Walls and Ceilings.

The wiring shall be carried out in an approved type of single core, plastic insulated cable enclosed in steel screwed conduit or trunking, mechanically and electrically continuous throughout.

Conduit and trunking shall be run on the surface of the walls and ceilings, or in false ceiling spaces. Conduit shall be secured in position by means of spacer bar saddles, and counter sunk brass screws. Conduit shall be run horizontally on the walls or vertically to switches or outlets.

6.03 System C - PVC Insulated Cables with Insulated Earth Continuity Conductor Enclosed in Concealed Non Metallic Conduit or Trunking

Wiring shall be carried out in an approved type single core, plastic insulated cable with earth continuity conductor enclosed in high impact, heavy gauge, non-metallic conduit or trunking.

Conduit shall be buried in the walls and floors of building, and either run in roof space or buried in structural slabs.

6.04 System D - PVC Insulated Cables with Insulated Earth Continuity Conductor enclosed in Non-Metallic Conduit or Trunking fixed to the Surfaces of Walls and Ceilings

Wiring shall be carried out in an approved type single core plastic insulated cable with earth continuity conductor enclosed in high impact, heavy gauge, non-metallic conduit or trunking.

Conduit and trunking shall be run on the surface of the walls and ceilings or in false ceiling spaces. Conduit shall be secured in position by means of spacer bar saddles. Conduit shall be run horizontally on the walls or vertically to switches or outlets.

6.05 System E - Mineral Insulated Copper Sheathed Cables

The wiring shall be carried out in single core or multi-core mineral insulated copper sheathed cables run on the surfaces of walls and ceilings, in the roof space or concealed in walls and floors.

6.06 System F - PVC Insulated and Sheathed Cables, Clipped to the Surface of the Walls and Roof Members or to the Ceilings

The installation shall be carried out in an approved type twin or three-core PVC insulated and sheathed cable. Cables shall be securely fixed to the surface of the walls and in the roof spaces, and shall be fixed to the underside of ceilings, only when there is no reasonable access from above. They shall be fixed to walls and the sides of roof members or in such other positions as may be approved by means of non-corrodible, saddles or buckle clips with non-corrodible fixings spaced at intervals not exceeding 225mm. Where cables pass through holes they shall be bushed.

Under no circumstances will joints be permitted in the run of a cable. Wires shall be connected together only by looping into the terminals of accessories or by approved mechanical connectors in suitable joint boxes. Under no circumstances will taped joints be permitted.

The cables sheathing shall be carried into the switch, ceiling rose or other accessories.

Cables shall not be installed within 300mm of a metal roof, unless clipped to the lower side of wooden joints or otherwise protected from radiant heat.

6.07 System G - PVC Insulated and Sheathed Cables Clipped to Roof Members and Run in Metal or Plastic Conduit Drops Concealed in Walls

The wiring shall be carried out as for System F except that cables shall be enclosed in steel or plastic conduit where drops are required to switches, distribution boards or accessories.

6.08 System H _ PVC Insulated Single Wire Armoured and PVC Sheathed or Paper Insulated Lead Sheathed Single Wire Armoured and Served Cables Laid in Ducts, Trenches and Saddled to walls

Cables shall be suspended on purpose - made frame and hangers, drawn through ducts or laid in trenches. Cables suspended on multiple hangers shall be so arranged that one cable can be removed without disturbing the others. Frames and hangers shall be galvanised or of non-ferrous material and shall not be fixed in contact with other metals with which they are liable to set up electrolytic action. All spacings of cable hangers and supports shall not exceed those laid down for the relevant size and type of cable in the current edition of the I.E.E. Regulations.

SECTION 7

CONDUITS, TRUNKING AND ASSOCIATED FITTINGS

7.01 Steel Conduits - Steel Trunking

Conduits shall be of welded heavy gauge Class B to British Standard Specification B.S.31. In no case will conduits smaller than 19mm diameter be used on the Sub-Contract Works. Conduits installed within buildings shall be of black enamelled finish except where specified otherwise. Where installed externally, they shall be galvanised. Conduit fittings, accessories or equipment used in conjunction with galvanised conduits shall also be galvanised or otherwise as approved by the Engineer.

Metal trunking shall be fabricated from mild steel of not less than 18 swg. similar in pattern to that manufactured by M.S Walsall Conduits Ltd. All sections of trunking shall be rigid fixed together and attached to the framework or fabric of the building at intervals of not less than 1200mm. Joints in trunking shall not overhang fixing points by more than 600mm.

All trunking shall be made electrically continuous by means of 25mm x 3mm copper links across each joint in the system. Connection shall be made by means of electro-tinned bolts (head inside trough) nuts (6mm dia. minimum) flat washers and spring washers, and where the trunking is galvanised, the galvanising shall be removed within 6mm of the jointing strap, and the area painted.

All trunking fittings (i.e. bends, tees, etc) shall leave the main trough completely clear of obstruction and continuously open except through walls and floors, at which points suitable fire resisting barriers shall be provided as may be necessary.

Where trunking passes through ceilings and walls the cover shall be solidly fixed 150mm either side of ceilings and floors and 25mm either side of walls.

Screws and bolts securing covers to trunking, or sections of covers together shall be arranged so that damage to cables cannot occur either when fixing covers or when installing cables in the trough.

Where trunking is used to connect switchgear or fuseboards, such connections shall be made by trunking fittings manufactured for this purpose and not by multiple conduit couplings.

Where boxes and bends or similar fittings are used, particular attention shall be given to avoid damage to cables on corners.

Where vertical sections of trunking are used which exceed 900mm in length, staggered tie off points shall be provided at 900mm intervals to support the weight of cables.

All trunking systems shall be painted as for conduit.

Where a wiring system incorporates galvanised conduit and trunking, the trunking shall be deemed to be galvanised unless specified otherwise.

The number of cables to be installed in trunking shall be such as to permit easy drawing in without damage to the cables, and shall in no circumstances be such that a space factor of 45% is exceeded.

Conduit and trunking shall be mechanically and electrically continuous. Conduit shall be tightly screwed between the various lengths so that they butt at the socketed joints. The internal edges of conduit and all fittings shall be smooth, free insulating substance shall be removed from the screw threads. Where conduits terminate in fusegear distribution boards, adaptable boxes, non spouted switchboxes, etc., they shall be connected thereto by means of smooth bore male brass bushes, compression washers and sockets. All exposed threads and abrasions shall be painted (using an oil paint for black enamelled tubing and galvanising paint such as 'Rust Anodi' manufactured by C.P. Development Co. (London) Ltd., for galvanised tubing immediately after the conduit are erected. All bends and sets shall be made cold without altering the section of the conduit, the inner radius of the bend shall not be less than 2½ times the outside diameter of the conduit. Not more than two right angle bends will be permitted without the inter-position of draw-in box. Where straight runs of conduit are installed, draw-in boxes shall be provided at distances not exceeding 12 metres. No tees, elbows, sleeves, either of inspection or solid type, will be permitted.

Conduit throughout shall be of sufficient section and so arranged with draw-in boxes to allow easy drawing in and out of any one or all of the cables in the conduit.

All metallic and non-metallic conduit shall be swabbed out prior to drawing in cables, and they shall be laid so as to drain off all condensed moisture without injury to end connections.

Conduit and trunking shall be run below and kept at least 150mm clear of hot water and steam pipes, and at least 150mm clear of cold water and other services unless otherwise approved by the Engineer.

Conduit installed and buried in walls shall allow a minimum of 10mm cover. These conduits and those cast 'in-situ' in concrete slabs shall be given one coat of rust prevention paint before installation of conduit and before concrete is placed. Sunk circular conduit boxes shall be provided with break joint rings of white moulded material or metal.

Surfaces conduit shall be run in square symmetrical lines and shall be marked on site for approval before installation. Conduit shall be fixed by means of distance saddles spaced at not more than 1200mm, for 19mm and 25mm conduit and 1.5 metres for larger sizes. Conduit shall be fixed each side of conduit boxes at a distance not exceeding 600mm.

Where conduit runs enter specified areas requiring flameproof equipment, barrier boxes shall be inserted immediately before the conduit enters the flameproof area. All conduit installed within this area shall be solid drawn galvanised, as shall be conduit fittings and

accessories and Buxton Certified as suitable for Group II hazards. Equipment shall comply with B.S. 229, B.S. 889 and Code of Practice C.P. 1003.

In no case shall conduit from different distribution boards be connected at one junction box, likewise cables from different distribution boards shall not be housed in the same conduit.

All boxes shall conform to B.S. 31, shall be of malleable iron, and black enamelled or galvanised according to the type of conduit specified.

All conduit boxes, except loop-in pattern in concrete floors shall be fixed direct to the structure apart from the support provided by the conduit.

Both lids where required shall be heavy gauge secured by means of brass screws.

Draw-in through boxes shall be provided in all conduit systems for the drawing in or out of any cables after installation is completed.

All adaptable boxes and lids of the same size shall be inter-changeable.

Boxes used on surface work shall be tapped or drilled to line up with the conduit fixed in distance type saddles allowing clearance between the conduit and wall without the need for setting the conduit.

Draw-in boxes in the floors shall be avoided except where they are essential when they shall be grouped in positions approved by the Engineer and covered by suitable floor traps, with non-ferrous trays and covers.

The floor trap covers shall be recessed and filled in with a material to match the floor surface.

The Sub-Contractor shall take full responsibility for the filling in of all covers, but the filling in materials will be supplied and the filling carried out by the Main Contractor.

Where buried in the ground outside the building the whole of the buried conduit shall be painted with two coats of approved bitumastic composition before covering up. Paint damage and joints under screed or cast in-situ shall be similarly treated.

Where run on the surface, unpainted fittings and joints shall be painted with two coats of oil bound enamel applied to rust and grease free metalwork.

7.02 Flexible Conduit

Conduit connections to motors and equipment shall be made using a minimum of 300mm waterproof flexible conduit. The solid conduit shall be terminated in a large BESA or adaptable box enclosing sufficient coils of motor cables to enable "Tong Test" readings to be taken in each conductor. Earth continuity shall be maintained by means of a copper conductor seized in accordance with the appropriate table of current edition of the I.E.E. Regulations and insulated with Green and Yellow PVC. This conductor shall be run

externally to the flexible conduit connecting apparatus to solid conduit and shall be secured to the connecting adaptors by an approved means.

All connecting adaptors shall be solid bronze or brass pattern with standard thread for conduit connection and a thread for conduit connection and a thread to receive the flexible conduit. The adaptor shall be sweated solid to the flexible conduit and the rub screw fully tightened.

7.03 Plastic Compound

All galvanised boxes and boxes in a situation where the air flow is likely to cause excessive condensation shall be filled with a plastic compound which fulfills the following conditions:-

No effect on the physical properties of insulation at any temperature.

No effect on metals, porcelain, synthetic resins, etc.,

Unaffected by atmospheric and temperature extremes.

Remains plastic indefinitely.

Has a high insulation value.

7.04 Telephone Conduit

The arrangement and size of telephone conduit shall be such as to accommodate the number of circuits as indicated on the Contract Drawings. Conduit shall terminate in standard metal boxes to B.S. 1363 with flush fitting cover plate. Draw wires of piano quality steel wire of not less than 22 swg. shall be left in all telephone conduit Draw-in boxes shall be provided in telephone conduit on the same basis as laid down for power and lighting conduit.

Telephone outlet boxes, draw-in boxes and the telephone distribution boxes shall be marked internally with yellow paint to distinguish them from boxes provided for other services.

7.05 Television Conduit

Television conduit shall be 19mm diameter thermo-plastic type installed vertically from each outlet point terminating 300mm above finished roof surface. A purpose made bend shall be screwed on to the conduit at its roof termination. Outlet points shall be the conduit at its roof termination. Outlet points shall be Belling and Lee Type 1480 complete with plug type L734/PAL, or other similar and approved, fitted to a flush plastic box to B.S. 1363. Draw-in wires as provided for telephone conduit shall be installed.

7.06 Cable Tray

Cable tray shall be fabricated from perforated mild steel tray of 150mm minimum width and 14 swg. with return flanges and coupling pieces for rigidity and strength similar to that manufactured by Messrs H. Greening (Wolverhampton) Ltd., Catalogue No. R.F. 7 type.

The cable tray shall be painted grey enamel for indoor use and shall be hot dipped galvanised for outdoor locations.

Cable tray shall be appropriately fixed on robust and substantial brackets fixed into the walls or shall be suspended on rods securely fixed to the structure together with a bracket arrangement as required to facilitate the support of the cable tray. Suspension rods shall be minimum 10mm. dia. mild steel, Brackets or suspension supports shall be provided as necessary, the spacing of which shall not exceed 1800mm.

Where the cable tray changes direction the minimum radius of bends shall not be less than 300mm on the inside of the bend and in no case shall be less than the bending radius of the cable supported.

All brackets, suspension rods and attachments shall be finished as the cable tray supported.

7.07 Rising Main Bus-Bars

The rising main bus-bar system shall comprise a sheet metal enclosure containing copper bus-bars rising through the building via the riser duct, and supplying the distribution system at suitable tap-off position.

The bus-bars shall be contained in a trunking of not less than 16 gauge sheet steel with detachable cover plates providing a reasonably dustproof enclosure. The covers shall be in sections the length of which shall be approved by the Engineer prior to manufacture.

Fixing brackets for wall fixing shall be provided at not less than 1800mm intervals

All steel work shall be given a rust preventative undercoat, and finished, in gloss enamel in an approved colour. All screws, bolts, nuts and washers shall be rustproofed.

Bus-bars shall be 4 pole 2 pole with full size neutral rated at the current indicated on the Contract Drawings, and shall consist of hard drawn, high conductivity copper bars.

Current ratings shall comply with B.S. 159 for a temperature rise not exceeding 50oC.

Copper fishplates shall be used for connection between the lengths of bars, and a high degree of conductivity shall be maintained.

The bus-bars shall be anchored rigidly in the vertical run, and approved means of taking up the maximum expansion and contraction likely to occur in the bars under normal

conditions shall be incorporated. The recommendations of the manufacturers in this respect shall be closely observed.

Phase colours shall be clearly marked.

Bus-bars shall be supported and anchored by means of suitable high grade non-hygroscopic and non-tracking insulation and designed to withstand the stresses set up under fault conditions.

Where the rising bus bar systems are carried through floors, a barrier of fire resisting material shall be incorporated in the trunking at each floor level to prevent the possible spread of fire between floors.

End covers shall be fitted at the top of the run.

A suitable cable entry with terminal type scaling end box shall be provided at the lower end of the system to accommodate the main cable, the size of which is shown on the Contract Drawings.

Tap-off units shall be of the type and current rating indicated on the Contract drawings. All connections to bus-bars shall be made by means of bolted type clamps designed to ensure maximum conductivity at all times, and drilling of bus-bars will not be permitted.

A 25mm x 3mm copper tape shall be installed externally for the full length of the bus-bar trunking. The tape shall be bonded to each section at intervals not exceeding 1200mm, by means of 20mm brass bolts, washers and lock nuts.

7.08 Under floor Ducting

Where under floor ducting is specified, it shall be of two or three compartment type manufactured from 16 gauge zinc coated steel with base plate and badly welded together to make a single unit. The capacity of each section shall be adequate for the number of conductors to be drawn in and the space factor as required for compliance with the current edition of the I.E.E. Regulations shall not be exceeded.

SECTION 8

CABLES IN CONDUIT OR TRUNKING

8.01 General

The wiring throughout shall be carried out by looping cables progressively from point to point and no tee or other joint will be permitted. Conductors of the same circuit shall be contained in the same conduit or trunking. At distribution boards, the neutral bar in the same sequence as the live conductors are connected to the fuses or circuit breakers so that they can be readily identified.

8.02 PVC Cable in Conduits

Unless otherwise specified cables shall conform to B.S. 6004. They shall be 600/1000 volt grade, single-core. No cable smaller than 1/1.38mm (1.5²) shall be used. Cable size shall comply with circuit details as indicated on the Contract Drawings. Slack cable shall be left at all points of connection.

When used with pinch type terminals cable ends shall be prepared as follows:-

- i) 1/1.38mm. (1.5mm²) and 1/1.78mm. (2.5mm²) - the conductor doubled back on itself to present a double thickness.
- ii) 7/0.85mm (4.0mm²) to 7/1.70mm. (15mm²) - the strands well twisted together to make as solid a conductor as possible.
- iii) 7/2.14mm. (70mm²) and above - the strands sweated solid or fitted with purpose made soldering thimbles.

Cables shall be delivered to the site with seals intact and offered to the Engineer for inspection prior to installation.

Care shall be drawn in after the erection of the complete conduit and trunking system, or completed section if approved by the Engineer and all plaster has dried out. Draw wires, tapes or cables shall not be threaded in at the time conduit is being installed.

The live and neutral conductors of a circuit shall be drawn in the same conduit or enclosure.

Cable sizes shall be selected to allow for a 20% increase in load on every final sub-circuit.

Space shall be left in conduit and trunking for drawing in at some future date two additional cables of size not less than the largest cable enclosed in the conduit or trunking being considered.

Not more than six final sub-circuit cables shall run in conduit feeding outlet boxes, without the approval of the Engineer. Not more than eight cables running straight back to the distribution board shall be enclosed in any one conduit. Flexible cords shall be of 300/500 volt grade VR or PVC insulated and shall comply with B.S. 6500. No flexible cord smaller than 0.75mm² shall be used. Flexible cords for pendant fittings shall be circular heat resistant type, white finish.

SECTION 9

TESTING ON SITE

9.01 Installation Tests

The Sub-Contractor shall conduct testing during and at the completion of the installation and if required, again at the expiration of the Maintenance Period, tests in accordance with the relevant section of the current edition of the I.E.E. Regulations, the Government Electrical Specification and KPLC Bye-Laws.

Tests shall be carried out to prove that all single pole switches are installed in the 'live' conductor.

Tests shall be carried out to prove that all socket outlets and switched socket outlets are connected to the 'live' conductor in the terminal marked as such, and that every earth terminal is effectively bonded to the earth continuity system. Tests shall be carried out to verify the continuity of all conductors of each 'ring' circuits.

Phase tests shall be carried out on completion of the installation to ensure that correct phase sequence is maintained throughout the installation.

The Sub-Contractor shall prepare and hand over to the Engineer within 14 days of the witnessed tests three copies of the results of the above tests. The Sub-Contractor shall be required to issue to the Engineer the requisite certificates upon completion as required by the current edition of the I.E.E. Regulations.

Any faults, defects, omissions, faulty workmanship or incorrectly positioned or installed parts of the installation made apparent by such inspections or tests shall be rectified by the Sub-Contractor at his own expense.

9.02 Testing Equipment

The Sub-Contractor shall provide accurate instruments and apparatus and all labour required to carry out the above tests. The instruments and apparatus shall be made available to the Engineer to enable him to carry out such tests as he may require.

9.03 Attendance on Other Contractors

The Sub-Contractor shall generally attend on other Contractors employed on the Works and carry out such electrical tests as may be necessary.

9.04 Equipment, Plant, Apparatus and Systems

The Sub-Contractor shall test to the Engineer's approval and as specified, all equipment, plant and apparatus forming part of the Works and before connecting to any power supply and setting to work.

Where such equipment, etc., forms part of, or is connected to, a system whether primarily of an electrical nature or otherwise (e.g. Air Conditioning System) the Sub-Contractor shall attend on and assist in balancing, regulating, testing and commissioning, or if primarily an electrical or other system forming part of the Works, shall balance, regulate, test and commission the system to the Engineer's approval.

SECTION 10

EARTHING

10.01 Earthing

The extent of earthing equipment to be installed as part of the Sub-Contract Works shall be as follows:-

10.01 Earthing System for High Voltage Supply

A main earth bus-bar of 55mm. x 6mm. of high conductivity hard drawn copper shall be mounted on insulators on the wall of the Sub-station at the position indicated on the Contract Drawings. The following connections shall be made to this bus-bar:

1. Insulated stranded cable connection to the transformer neutral
2. Bare conductors to the transformer frame.
3. Bare conductor to H.V. switchgear frame.
4. Bare conductor to L.V. Switchgear frame.
5. Insulated stranded conductor to sub-station earth electrodes.

The size of the earth continuity conductors shall be as follows:

<u>Maximum Prospective Fault Current</u>	<u>Insulated Stranded Conductor</u>	<u>Bare Copper Conductor</u>
14 KA	19/2.52 (95mm ²)	25mm x 9mm
9 KA	19/2.14 (70mm ²)	25mm x 3mm

Where necessary, earthing connections shall be protected against mechanical damage and corrosion.

Where connections are made to the earth bus-bars, contacting surfaces shall be tinned.

The earth electrodes shall comprise 8 earth rods, installed in pairs, each pair connected together and to the earth bus-bar by an insulated stranded conductor. The earth rods shall be 1.5m long by 15mm. dia, extensible type as "Copperweld" or other equal and approved, each pair of electrodes shall be located not less than 3m. apart, the first pair being not less than 3m. from the building. The head of the earth rods shall be driven to 300mm below the surface of the ground and enclosed in a concrete box with a concrete inspection cover. The metal sheaths of all H.V. and L.V. cables shall be adequately bonded to the appropriate switchgear frame.

10.02 Earthing System for L.V. Supply

Where the supply is taken at L.V. from either a Substation on the site or a remote substation, the following earthing equipment shall be installed.

1. In the main switchroom (supply intake):

A copper earth bus-bar, as described in Clause 10.01.

A bare 25mm x 3 mm copper conductor from each item of isolated switchgear, connected to the earth busbar.

A complete earth electrodes system, installed as specified in Clause 10.01, connected by an insulated earth continuity conductor to the earth busbar.

2. In the switchrooms of isolated buildings on the site.
A similar earthing installation to that described in (1) above.
3. In the event of the K.P.& L. Co. providing an earth terminal at the intake position, the earth electrodes and earth continuity conductors, described in (1) and (2) above, shall be omitted.

10.03 Protective Multiple Earthing

Where protective multiple earthing (PME) is provided by the supply undertaking, the earthing lead shall be connected to the consumer's earthing terminal and, together with the neutral conductor of the installation, shall be so arranged that connection to the neutral conductor of the incoming supply can be carried out by the supply undertaking.

The earthing of the installation shall comply with the requirements laid down in the current edition of the I.E.E. Regulations. The earthing system for H.V. supply, described in Clause 10.01 shall be amended for the provision of separate earth electrodes for the H.V. and L.V. sides of the installation.

In addition, provision for earthing the neutral conductor shall be made for each distribution main at the end farthest from the transformer where it is connected to the main switchboard of an independent building or area of the site.

10.04 Consumer's Earth

The consumer's earth is deemed to be the earthing terminal at:-

1. The main L.V. switchboard
2. The L.V. switchboard at the intake position of an isolated building.

The consumer's earth will be bonded to the earth bus-bar in the sub-station in an approved manner.

10.05 Bonding

All conduit, trunking metal enclosures, the metallic sheathing of cables, the cases and enclosures of switchgear, fuse gear and apparatus of electrical nature in each building shall be so bonded as to be directly connected to the respective consumer's earth. Earthing arrangements and resistance of the earth continuity conductor shall comply with the current edition of the I.E.E. Regulations.

In situations such as bathrooms, kitchens, laundries or any situation where there is exposed metal and socket outlets or fixed appliances are installed, all metal work including hot and cold water pipes, waste pipes, metal draining boards, the casing of electrical appliances, etc., shall be effectively bonded to the earth continuity conductor of the electrical installation so as to ensure that no difference in electrical potential can arise between these items.

Earthing system shall be tested in accordance with the current edition of the I.E.E. Regulations, and if the minimum impedance required by the I.E.E. Regulations is not obtainable, the Engineer shall be informed.

The Sub-Contractor will be responsible for rectifying any fault in the earth continuity conductor at his own expense.

SECTION 11

INSTALLATION OF LIGHTING FITTINGS

11.01 Fixings

Information on the proposed method of fixing each type of lighting fitting is included in Part C of the Specification.

11.02 Alignment

Care shall be taken that individual lighting fittings are aligned with the ceiling in all planes and that there is proper alignment in groups or rows of lighting fittings.

Where necessary, cast iron extension rings shall be used to provide alignment between recessed point boxes and finished ceiling levels.

11.03 Enclosures

In situations where a lighting fitting is fitted to a ceiling of combustible material, the back plate or other accessory shall be so designed that the connecting cables are completely enclosed.

11.04 Earthing of Lighting Fittings

At every lighting point an earthing terminal shall be provided and connected to the earth continuity conductor of the final sub-circuit.

11.05 Programme for Erection of Lighting Fittings

The Sub-Contractor shall liaise with the Main Contractor in order that lighting fittings can be erected at such a time that:

- i) The work of other trades is not inhibited by the presence of the fittings in-situ.
- ii) No damage is caused to finished ceilings or walls
- iii) Where fittings are located in selected spaces left open in a suspended ceiling, there is adequate clearance for the fittings, access to suspension points, and clearance for any other services in the ceiling void at that point.

No. claims will be considered for costs of extra works or damages which arise out of the Sub-Contractor's failure to comply with this clause.

SECTION 12

LIGHTING AND SINGLE PHASE POWER ACCESSORIES

12.01 General

The lighting switches, socket outlets, fused spur outlets and similar accessories shall be as specified. The type of accessory to be used in each location is related to the type of wiring system in that area,

In all cases where switches are grouped together, and are connected to the same phase they shall be ganged together and mounted in a multi-gang box and plate.

Where switches control points not readily visible from the switching position the plates shall be engraved to indicate the points controlled.

All switches controlling maintained circuits shall have the word 'MAINTAINED' engraved on the switchplate.

Multi-gang switch boxes, containing switches supplied from different phase shall have integral fixed separators segregating the switches on different phases. Each such segregated compartment shall have a separately fixed metal cover clearly marked 'Danger' 415 volts' and the overall switchplate shall cover the whole.

12.02 Special Accessories

Accessories for special purpose such as speed controls for small motors, dimmers, flameproof or sparkless switches, etc., shall be as specified. Where special accessories are supplied as part of the Sub-Contract Works they shall have a finish to match the other accessories installed in the same area.

SECTION 13

PLANT POWER WIRING

13.01 General

Wiring to motor outlets and control outlets in Plant Rooms, Boiler Houses, etc., and to remote motor and control outlets forming part of the Mechanical Engineering Services installation, shall be carried out in one of the wiring systems described in the specification.

The approximate location of motor and control outlets, distribution boards and control panels is shown on the Contract Drawings. Details of the size and type of cables, and rating of fuseways or circuit breaker are shown on the diagram of connections.

Precise instructions on the Sub-Contractor's responsibilities for the supply, fixing and connecting of equipment such as isolators, starters, control switches, sensing elements, annunciator panels, etc., are given in the Particular Specification. Where such items of equipment are provided by others it will be their responsibility to issue to the Main Contractor schematic diagrams; diagrams of connections and details of any special requirements, such as the provision and specification of screened cables and to ensure that the equipment is suitable for the electrical characteristics of the supply available.

13.02 Power Outlets for Lifts

The outlet for each lift shall terminate on an isolator located at the position shown on the Contract Drawings. The rating of the isolator and the size and type of cables are shown on the diagram of connections. Each outlet shall be wired on a separate circuit using butyl rubber cables in conduit or MICS cables, as indicated on the diagram of connections.

The switch fuse controlling a Firemen's Lift shall be located on the main switchboard, and shall be provided with means for padlocking in the 'ON' position.

Where the installation includes a mains failure generator, the supply to the Firemen's Lift shall be connected to the 'essential services' section of the main switchboard.

The isolating switch controlling each lift shall disconnect all supplies to the lift hoist and control equipment

SECTION 14

NON-METALLIC CONDUIT

14.01 General

Non-metallic conduit shall be best quality new super high impact grade heavy gauge Class 'A' rigid PVC unplasticised conduit as manufactured by Ega Africa Ltd., suitable for plain connections.

14.02 Manipulation

The conduit shall be bent and formed strictly in accordance with the manufacturer's instructions.

- i) Small sizes, i.e. 15mm, 19mm and 25mm, shall be bent cold by inserting the correct size bending spring. It is essential for right angle bends that the conduit is bent past 90° to allow for 'spring back'.
- ii) Larger sizes of conduit shall be preheated before inserting rubber cord to prevent kinking. Conduit badly formed or bent, or damaged in any way, shall not be used.

14.03 Joint of Plain Conduit

Joints shall be made water-tight by the use of 'Egaweld' cement applied with a brush or rag. 'Egaweld' shall be applied to the complete circumference of the conduit. Conduit shall be thoroughly cleaned at the ends to ensure a good adhesion to the end fittings. 'Egaweld' shall not be permitted to enter into the conduit.

14.04 Conduit Fittings

All conduit fittings and accessories including couplers, reducers, stopping plugs, lock nuts and male and female bushes shall be manufactured to B.S. 4607 Part 1, 1970.

Solid tees shall not be used. Solid or inspection elbows or bends or inspection tees shall be used only in exceptional circumstances and then only with the Engineer's approval.

Where it eases the installation of cast-in-situ back entry boxes on the looping system, purpose made bends manufactured by Egatube and comprising a tight bend with a push socket at one end and a threaded socket at the other may be used.

14.05 Fixing of Conduit

Conduit shall be installed on the loop-in system and shall be either cast-in-situ in the main concrete structure concealed in chases case in concrete wall, or chases cut in solid partition walls, run in ceiling spaces or in hollow partitions or floors; concealed below the floor screed, whichever shall prove to be the most suitable method of installation for use in the building under construction. Unless it is clearly specified or shown on the drawing, the method of installing conduit shall be subject to the approval of the Engineer.

Sunken conduit run in chases in walls or ceilings shall be fixed by spacer bar saddles fixed not more than 900mm apart.

Surface conduit shall also be fixed 125mm. on both sides of all boxes, the box itself being securely fixed. Where such an arrangement of boxes and saddles would prove to be both unsightly and unnecessary, short lengths of conduit not exceeding 900mm. in length between boxes need not be secured further than by connection to the adjacent boxes. In such cases the Engineer reserves the right to insist upon additional fixings being provided, should he for any reason whatsoever consider additional fixings necessary.

Where two or more lines of conduit run parallel to each other, on the surface of walls, etc., the distance between them shall be not less than 20mm. and conduit shall not cross.

Conduit shall be installed in such a manner as to prevent interference with other services and shall be kept at least 150mm. clear of gas or water pipes, and heat in excess of 68°C.

A means of expansion shall be provided in conduit runs in excess of 6m. without any bend or set, by the use of "Egatube" expansion couplings, which shall also be used at building expansion joints.

Conduit cast-in-situ shall be frequently secured to the steel reinforcement work, with heavy binding wire to prevent movement of the conduit and conduit boxes during the pouring and vibrating of the concrete. Outlet boxes shall be filled with paper to prevent ingress of concrete, and all boxes shall be securely fixed to the shuttering with nails, or by means which shall be visible as a marked on removal or the shuttering only where these marks can be concealed. Conduit shall be installed after the first grid of steel reinforcement work is securely fixed and all open ends of conduit shall be protected by couplings plugged with a suitable non-metallic stopping plug. The number of right angle bends in conduit cast in-situ shall not exceed two between boxes. Immediately prior to installing the wiring all conduit and fittings shall be dried and cleaned out by drawing through a cloth swab. Rawl plugs shall be used for fixings to brickwork, self-tapping screws for fixing to aluminium section, rawlnuts, spring toggles, gravity toggles or rawlbolts shall be used for fixing to other materials as approved by the Engineer.

Corners shall be turned by easy bends or sets made in accordance with the manufacturer's instructions without altering the section or splitting the conduit.

14.06 Circular Inspection Boxes

Boxes will not be permitted in floors unless approved. Boxes cast-in-situ must face downwards from the ceiling/floor section.

Small standard circular non-metallic conduit boxes, conforming dimensional with B.S. 31/1940 with standard circular non-metallic (3mm) lids and nylon fixing screws, shall be provided and fixed at all junctions.

The above circular boxes or equivalent looping boxes shall be provided and securely fixed for all ceiling points. When the conduit is run on the surface, all circular boxes for ceiling points shall be fixed with screws.

Where ceiling roses occur and the ceiling box is recessed below the finished level of the ceiling, suitable extension rings to accommodate the ceiling rose must be provided.

Where ceiling boxes, including extension rings, are flush with the ceiling surface, break joint rings shall be provided to hide the joints.

Where a non-metallic outlet box of thermoplastic material is used for the fixing or suspension of a lighting fitting, care shall be taken to ensure that the temperature of the box does not exceed 60°C and the box shall be fitted with Egafrica steel insert clips.

14.07 Stopping Plugs

All spare ways in junction boxes, etc., left for possible future extension shall be fitted with stopping plugs.

14.08 Continuity

Where fittings and accessories require earthing, an earth continuity conductor shall be run through the conduit. The earth continuity conductor shall be of copper minimum size 1.0mm² and shall be continuous between terminals. Where the earth terminal is formed by a brass screw and washer, 'Ross Courtney' terminations shall be used.

All metal boxes shall be equipped with an earth terminal.

Each final sub-circuit that is required to be earthed shall be provided with its own individual earth continuity conductor which shall be run from a terminal on the earth bar in the distribution board or consumer's control unit protecting the particular final sub-circuit.

PART B

ELECTRICAL ENGINEERING SERVICES

PARTICULAR SPECIFICATION

SECTION 1

PARTICULAR CONDITIONS

1.01 Location of Site

The site of the proposed Sub-Contract works shall be in Nairobi, Kenya.

1.02 Description of Project

The project shall comprise the development of a mixed use development building.

1.03 Commencement of Works

The Sub-Contractor in submitting his tender shall be deemed to have included for commencing any necessary work on site at such time as will comply with the Main Contractor's Program.

1.04 Climatic Conditions

The following climatic conditions apply at the site of the works and all plant, equipment, apparatus, materials and installations shall be suitable for these conditions.

Maximum temperature- 31°C

Minimum temperature- 17°C

Average temperature range- 24°C

Relative humidity range- 50% - 85%

Altitude- 1350 M above sea level

Latitude- 0° 10'03S

Longitude- 34° 27'55E

Rainfall- Extremely heavy at certain periods of the year

The Sub-Contractor shall be deemed to have taken account of the above details in his prices and his planning of the execution of the works.

Unless otherwise stated, all ratings of plant, equipment and apparatus shall be interpreted as site ratings and not sea level or other ratings.

1.05 Scope of Sub-Contract Works

The Sub-Contract Works shall comprise the supply, delivery, erection, testing, commissioning and setting to work of the Electrical Engineering Services as detailed in this Specification and accompanying Contract Drawings.

The Sub-Contractor shall include for all apparatus and appliances not particularly called for in this Specification or on the Contract Drawings but which are necessary for the completion and satisfactory functioning of the Sub-Contract Works.

No claims for extra payment shall be accepted from the Sub-Contractor due to his failure to adhere to the above requirements.

It is deemed that if, in the opinion of the Sub-Contractor at the time of tendering, there existed a discrepancy between the Specification and the Contract Drawings, that the Sub-Contractor clarified this difference with the Engineer before tendering.

The works to be installed under this Sub-Contract shall comprise but not restricted to the following: -

1. K.P.L.C Main incoming electricity supplies.
2. Main Low Voltage Switchboard, sub-main switchboards, distribution boards and consumer units.
3. Electrical distribution systems and works associated with mechanical services.
4. Sub Mains cable and associated sub boards.
5. Lighting and Power Installations.
6. Lightning Protection System.
7. Security Lighting System.
8. Fire Alarm and Detection system.
9. Surveillance system

1.06 Ordering

The Sub-Contractor shall order materials from the quantities taken from his own approved working drawings and not from the quantities shown on the Contract Drawings or in the Specification

1.07 Builder's Work Requirements

The structural and other provisions allowed for are indicated on the Contract Drawings. If the Tenderer requires any other provisions, he shall mark them in a contrasting color and submit them as part of his tender.

1.08 Statement of Compliance

The Tenderer shall provide as an integral part of his bid, a statement of compliance in which he shall clearly declare any items of the Specification to which his offer does not comply and the alternative which is included in the offer.

1.09 Storage of Materials

The Sub-Contractor shall be liable for the cost of any storage accommodation provided specially for their use. No materials shall be stored or stocked on suspended slabs without the prior approval of the Architect.

If the Sub-Contractor does not wish to use the storage space provided by the Main Contractor, he may, at the Engineer's discretion, be allowed to store these in his premises. In this case, the Sub-Contractor shall be required to provide a security bond specifically covering these materials intended for use on the Sub-Contract Works.

1.10 Labour Camps

Labour camps will not be permitted on the site and the Sub-Contractor shall allow for all transport and other charges in moving labour to and from the site.

1.11 Site Visit

The tenderer is recommended to visit the site and shall be deemed to have satisfied himself with regard to the conditions under which the Sub-Contract Works shall have to be carried out.

SECTION 2

INCOMING ELECTRICITY SUPPLIES

2.01 General

The electricity supply shall be derived from the Kenya Power and Lighting Company network. The incoming low voltage cables from Transformer will be supplied, installed and connected to the main Low Voltage Switchboard by K.P.L.C. The Main Low Voltage Switchboard shall be supplied and installed under this contract.

A Provisional Sum is included in the appropriate price schedule for the service line charges that will become payable to the Kenya Power and Lighting Company.

The Sub-Contractor shall ascertain the size and type of incoming Low Voltage supply cables that will be installed by the Supply Authority and thereby ensure that the correct glands and terminations for the service cables entries into the Main Low Voltage switchboard are provided.

2.02 Earthing

Earthing and bonding shall be carried out to comply with the regulations currently in force and copper tape mesh system shall be installed adjacent to the Kenya Power and Lighting Company supply intake.

The copper tape mesh system has been decided on due to the nature of soil resistivity at the proposed site for construction.

A provisional sum has been included in the appropriate price Schedule for any additional cost that may be necessary to achieve an effective and permanent earthing system.

Provision shall be made for protective multiple earthing at the main meter boards with the final connection between the neutral and the consumers earthing terminal being effected by the Kenya Power and Lighting Company Limited's electrode system.

2.03 Metering Power Supplies.

The electricity power supply to the building shall be metered via K.P.L.C.'s maximum demand (kVA) and energy (kWh) meters supplied at 11KV and

connected at the Main Low Voltage Switchboard by K.P.L.C. The entire building is connected to both supplies from K.P.L.C. and standby generator.

2.04 Attendance

The Sub-Contractor shall pay all attendance and liaise fully with Kenya Power and Lighting Company in ensuring satisfactory completion of all their work.

SECTION 3

MAIN L.V. SWITCHBOARD

3.01 Scope of Work

This section of the Specification covers the supply, installation, testing and commissioning of the Main Low Voltage Switchboard in accordance with the Contract Drawings and Specification.

3.02 Contract Drawings

The Schematic Layout of Main Electrical Distribution for the Building is shown on the contract Drawings.

The Sub-Contractor shall be deemed to have studied all the Contract Drawings and to have allowed for any necessary provisions in this section of the works required thereby.

3.03 Low Voltage Switchboard General Requirements

The Low Voltage Switchboard and meter boards shall be self-supporting floor mounted cubicles with front access incorporating the equipment as detailed on the Schematic Layout of Main Electrical Distribution System.

They shall also be supplied complete with all internal connections, voltmeter, instrument selection switches, cable glands or boxes and current transformers for the supply Authority's meters. The switchboard shall have a separate compartment to house the Kenya Power and Lighting Company metering equipment.

The switchboard shall be in accordance with the Specification.

The main Low Voltage Switchboard shall be capable of extension and the busbar section shall allow for this provision. The Engineer reserves the right to make such variations to the layout and dimensions of the switchboards as are deemed necessary to suit site conditions.

The arrangement of these switchboards shall be capable of accommodating power supply connection to all part of the buildings.

3.04 Fuse Switches

The fuse switches shall be as shown on Schematic Layout of Main Electrical Distribution and shall be as manufactured by Merlin Gerin to BS 5419. The fuse switched shall be provided complete with Class Q1 H.R.C. cartridge fuse links and three spare fuse links of each size fuse.

3.05 M.C.C.B.'s

Moulded case circuit breakers (M.C.C.B's) of fault breaking capacity of over 50KA shall be installed and shall be of Merlin Gerin manufacture unless otherwise stated.

These M.C.C.B's shall be as shown on Schematic Layout of Main Electrical Distribution system. Where switches or isolators are specified, these shall be moulded case switches and shall be capable of interrupting currents upto 10 times the rated current. They shall be as manufactured by Merlin Gerin.

SECTION 4

ELECTRICAL DISTRIBUTION SYSTEM

4.01 Scope of Work

This section of the Specification covers supply, installation, connection, testing and commissioning of the Sub-main cables, consumer units and distribution boards in accordance with the Contract Drawings and Specification.

4.02 Sub-main Cables

The sub-main cables and methods of installation shall be as shown on the Schematic and Layout Drawings and/or as specified in this Specification. The cables shall be as manufactured by East African Cables Ltd. or other equal and approved.

4.03 Distribution Boards and Consumer Units

The distribution boards and consumer units shall conform with the requirements of this Specification and shall be as manufactured by M/S Square D. Ltd., ABB, Schneider or other equal and approved.

Schematic of individual distribution boards and consumer units have been prepared and the Sub-Contractor should note that power boards consist of single phase and three phase sub-circuits ways.

All neutral conductors in a single phase distribution board shall be connected in the same circuit sequence as its phase conductor, i.e. phase wire No. 1 connected to No. 1 terminal on the neutral bar, etc.

In addition to this requirement for every distribution board each phase and neutral conductor shall have clipped to its sheath in the distribution board a clip-on numbered tag corresponding to its circuit number. The tag shall be of a type manufactures by M/S. Critchley Brothers Ltd or equal and approved type. All circuit numbers shall commence from left to right.

4.04 Electrical Services Associated with Mechanical Services Installation

4.04.1 Scope of Work

Work to be carried out under this section includes the supply, installation, wiring to and connection to the mechanical equipment power supply isolator or its control panel. The supply, installation, testing and commissioning of the equipment control panel, wiring between control pane; and equipment shall be by the Mechanical Equipment sub-contractor.

The electrical services shall be associated with the following mechanical equipment: -

- a) Domestic water pumps (duty and standby) and the associated control panel.
- b) Rainwater pumps (duty and Standby) and the associated control panel.
- c) Fuel Interceptor pump (petrol interceptor pumps) (duty and standby) and associated control panel.
- d) Sprinkler pumps (duty and standby) and associated control panel.
- e) Wet Riser Pumps (duty and standby) and associated control panel.
- f) Waste water treatment plant pumps (duty and Standby) and associated control panel.
- g) Hose reel pumps (duty and Standby) and associated control panel.
- h) Domestic/Rain water transfer pumps (duty and standby) and the associated control panel.
- i) Air conditioning and Mechanical ventilation services and their associated control panels.

4.04.2 The Electrical Services shall also be associated with the provision of power supply up to the isolator or control panel of the following specialised equipment:-

- a) Electric passenger lifts and associated control panel.
- b) Electric Bullion Hoist and associated control panel.
- c) ELV equipment.
- d) Surveillance equipments
- e) Fire protection system

4.05 Fuse Switches (Loose Equipment)

Fuse switches shall conform with the requirements as detailed.

4.06 Isolator (Loose Equipment)

Isolators shall conform with the requirements detailed in this specification but with exception that solid links shall be suitably sized to carry the full rated current

of the respective isolators. Unless otherwise stated, isolators shall be designed for load making/load breaking duties.

4.07 Cable Tray

Sizes, proposed fixing arrangements and routes of the galvanised cable tray have been detailed on the layout drawings. The cable tray shall conform with the requirements as detailed

4.08 Cable Schedule

The sub-contractor shall prepare a suitable cable route and schedule for all major Low Voltage cables within the Facility. The schedule shall be submitted with working drawings after contracts have been exchanged. During the course of installation, each major cable shall be suitably identified along its route by traffolite cable markers, in accordance with the Sub-Contractor's cable schedule.

4.09 Rising Main Bus bars

There shall be for sub- boards for each block and additional board for mechanical loads.

Phase colours of the incoming cables to each board shall clearly be marked and the current ratings shall comply with B.S. 159 for a temperature rise of 50°C.

All connections to the boards shall be made by means of bolted type clamps designed to ensure maximum conductivity at all times, and drilling of bus-bars in the boards shall never be permitted.

4.10 Fire Barriers

Where the rising bus bar systems, vertical cable tray installations, vertical trunking installations pass through floors, a barrier of fire resisting materials shall be incorporated around the installations at each floor level to prevent the possible spread of fire between floors.

The fire barrier shall be foil clad, wire mesh reinforced 5mm thick fire barrier curtain, complete with metal fixing strips as RBC Envirograf 1983 - 1993 tested to BS 476 part 20/22 or equal and approved.

4.11.0 Power Factor Correction Equipment

4.11.1 Scope of Works

This section of the specification covers the supply, installations, connections, testing and commissioning of the power factor correction equipment and to ensure that at the peak of the demand the power factor shall be maintained at 0.95.

- 4.11.2 The anticipated maximum demand for the building is 2.5MVA. The power factor correction equipment shall be in separate free standing steel cabinet and shall be interconnected with the main L.V. Switchboard. The equipment shall be installed in the switchroom.

The power factor correction equipment shall be dry resin encapsulated, shall have low losses and shall be self-healing. The capacitors shall be delta connected.

The power factor relay shall be cyclic type with built in power factor meter.

The capacitors shall incorporate automatically switching facilities to vary the capacitors in circuit depending on load variations.

SECTION 5 LIGHTING AND POWER INSTALLATION

5.01 Scope of Work

This section of the Specification covers supply, installation, connection, testing and commissioning of the lighting and single phase power installation in accordance with the Contract Drawings and Specification.

5.02 Wiring System

Final sub-circuit wiring shall be carried out using single core PVC insulated copper cables enclosed in a system of high impact heavy gauge PVC conduit. The conduits shall be embedded in the fabric of the building or run surface on the roof members.

All single phase 13A socket outlets shall be wired using 30A ring main circuit system or 20A radial circuits as shown on the Contract Drawings.

An insulated earth continuity conductor shall be enclosed in all non-metallic conduits.

5.03 Lighting Luminaries

Lighting Luminaries shall be of the type and manufacture as detailed in this Specification.

All luminaries shall be supplied and installed complete with lamps and tubes of the wattage specified.

All fluorescent tubes shall be warm white as manufactured by Thorn Lighting or other equal and approved and shall conform to B.S. 1853.

The lighting luminaries shall be connected to a Digital Addressable Lighting Interface (DALI) System.

5.04 Lighting Switches and Socket Outlets

In general areas Lighting switches shall be flush mounted, single pole, 15A rating, rocker operated grid switches with ivory moulded plastic cover plates.

Socket outlets and spur units shall be flush mounted 13 Amp. rating with rocker operated switches and ivory plastic moulded cover plates.

All lighting switches and socket outlets shall be as manufactured by M/S Crabtree Ltd., MK. Electric Ltd., Nettle Accessories Ltd. or other equal and approved.

5.05 Cooker Control Units

Cooker control units shall be flush mounting, with 45 Amp. D.P. switch, 13 Amp switched socket and neon indicators. An appropriate connector block shall be installed at low level. The cooker control units shall comply fully with B.S 4177 and shall have ivory plastic cover plates.

5.06 Connector Boxes

Connector boxes for cookers and water heaters shall be flush mounted with moulded cover plates. The connector boxes shall be supplied complete with terminal blocks and cords grips, terminals shall be capable of accommodating up 2 No. 10mm² stranded copper conductors.

5.07 Ramp Lighting

The work under this section includes the supply and installation of the ramp lighting as shown on the Contract Drawings. The ramp lights shall comprise of 18W PL lamp in 300mm dia. polycarbonate post top lanterns as specified on the contract drawings or equal and approved.

The ramp light shall be on top of the ramp parapet wall.

5.08 External lighting

The works under this section includes the supply and installation of the external security lighting and floodlighting of the building.

The external security lighting comprises of 18W PL lamps fitted in 300mm diameter white polycarbonate spheres suitable for external wall mounting. The security luminaries shall be controlled via photoelectric cell mounted on roof. The photo electric cell shall detect darkness in the evening and then energises the contactor coil to switch on power supply to the external luminaries via the respective distribution boards located in the riser ducts.

The car park lighting shall be controlled by photoelectric cells. Power supply to the car park lighting shall be derived from the consumer unit at the Gate House.

5.09 Adaptor Boxes

All adaptor boxes draw-in boxes, conduit boxes, lighting points boxes, boxes for sockets, telephone outlets, television outlets, camera boxes etc. shall form part of conduit layout installations.

5.10 Sub-Main Cables

All main and sub-main cables shall be supplied complete with glands, lugs etc.

SECTION 6

LIGHTNING PROTECTION SYSTEM

6.01 Scope of Work

Under this section of the specification, the Sub-Contractor shall supply, deliver, install and test a lightning protection system as shown on the Contract Drawings.

The Sub-Contractor shall include for the supply and installation of the roof tapes network, all bonding to down conductors and other metal works and earthing as indicated on the appropriate drawings.

6.02 Description of Installation

The installation is based on the recommendation of Kenya Bureau of Standards and I.E.C 62561 and shall comprise a network of 25mm x 3mm flat copper roof tapes running on the ridges and parapet wall and bonded to a selected 20mm diameter reinforced steel (lengths welded to form a sound and effective electrical continuity down to the concrete foundation bases). At the basement level, the down conductors shall be bonded to a system of effective earthing comprising of earth mats as specified herein.

6.03 Bonding of Roof Copper Tapes

The roof copper tapes shall be fixed onto the roof ridges; parapet wall etc by means of special holdfasts.

All roof tanks and other metal works projecting from the roof shall be bonded to the roof copper tapes.

6.04 Earthing of Lightning Protection System

Earthing of the lightning protection system shall be effected by bonding 20mm diameter reinforced steel down conductor to 25mm x 3mm earth matt constructed from the 25mm x 3mm copper tape as detailed in the contract drawings.

The earth matt shall be placed in an earth pit 1200mm x 1200mm x 800mm deep. The earth matt shall then be filled with red soil mixed with charcoal in the ratio of 3:1. The earth pit shall then be covered by concrete slab.

The periodical testing of the earthing for lightning protection system shall be conducted at the earth testing point in the basement column and as clearly shown on the contract drawings.

The expected earthing test result for this specification shall never be above 5 ohms.

6.05 Earth Continuity Test for Down Conductors

It will be the responsibility of the Electrical Sub-Contractor to ensure that the 20mm reinforced steel down conductor is properly welded to guarantee earth continuity from roof to foundation level.

The electrical sub-contractor shall witness and be satisfied that concrete pouring to the columns with lightning protection down conductors does not affect the welded points.

SECTION 7

TELEPHONE/COMMUNICATION DISTRIBUTION SYSTEM

7.01 Scope of Works

This section of the specification covers the supply and installation of trunkings, conduits and cable trays for the distribution of telephone system, communication system like Television network via satellite dish on roof all in accordance with the Contract Drawings and specification.

The supply and installation of the telephone equipment, communication equipment - T.V. and C.C.T.V. does not form part of this sub-contract.

7.02 Distribution System

At the ground floor level, the sub-contractor shall supply and install a cable tray for the installation of the main incoming line from the main point of entry into the building to the proposed server room.

The sub-contractor shall also provide and install cable tray from telecomm closets to riser duct and all the length of riser duct upto highest floor ceiling.

The electrical sub-contractor shall provide conduit interconnections between each cabinet box and office floor trunkings. Details of the office floor trunkings are shown on the Drawings and the trunking shall be 3-compartment with a separate compartment for telephone cables. The electrical sub-contractor shall provide and install an accessory box and data outlet plates (plug-in type as specified) for connection by other. Outlet plates shall be as manufactured by M/s. Crabtree Ltd, MK Electric Ltd or other equal and approved. Draw wires shall be installed in all conduits to facilitate wiring by others.

A metallic trunking 200mm x 50mm 3 - compartment shall be provided and installed by electrical sub-contractor in the same ICT riser duct from ground floor to highest floor for the accommodation of communication cables, T.V. cables and Fire Alarm and Detection system cables.

7.03 Wiring System

The Sub-Contractor shall supply and install lead-in pipe of diameter 100mm for the main incoming last mile cables.

The Sub-Contractor shall allow for all conduit installation from the cabinet to the data outlet position. The final wiring from the distribution case to each telephone outlet shall be carried out by others.

The minimum size of conduit shall be 25mm diameter and not more than 3 data outlets shall be fed by each 25mm diameter conduit.

At each telephone outlet position the sub-contractor shall supply and install an accessory box and outlet plate for connection by others. Each outlet plate shall comprise of jack plug mounted on an ivory plastic moulded cover plate to match the other accessories used.

Outlet plates shall be as manufactured by M/S Crabtree Ltd., M.K. Electric Ltd., Nettle Accessories Ltd., or equal and approved.

SECTION 8

FIRE ALARM AND DETECTION SYSTEM

8.01 Scope of Work

This section of the Specification covers supply, installation, connection, testing and commissioning of the fire alarm and detection system in accordance with the Contract Drawings and Specification.

8.02 Operation

The fire alarm system shall function as follows: -

In the event of a fire breaking out in any part of a building the alarm can be raised by an observer breaking the glass of the nearest contact. As a result of this action the following signals will be initiated: -

- a) All the alarm bells within the affected zone shall sound.
- b) The lamp of the appropriate zone indicator on the annunciator panel will be illuminated.
- c) A supervisory alarm buzzer on the annunciator panel will sound.

Such signals may be initiated similarly by smoke or heat detectors.

The audible alarms may be silenced by a 'Mute' switch on the annunciator panel. The zone indicator will however remain illuminated until the broken glass of the fire alarm contact is replaced and the system re-set.

The operation of the 'Mute' switch shall not preclude the receipt of further alarm signals from other zones.

8.03 Wiring System

The equipment shall be wired using a 24 volt series fault monitoring circuitry with each floor of the building constituting a separate zone on the annunciator panel.

Wiring shall be carried out using single core PVC insulated copper cables enclosed in high impact PVC embedded in the fabric of the building.

The fire alarm conduit system shall be completely separate from all other systems. Red conduits shall be used in the ceiling voids or all exposed areas. The system shall be in accordance with BS 5839 PTI (1980).

The 24 volt DC supply for the system shall be derived from a battery/charger unit within the annunciator panel located on the Ground Floor reception area.

8.04 Battery/Charger Unit

The battery/charger unit will be incorporated in the annunciator panel and shall contain a trickle charger unit, nickel cadmium battery cells, voltmeter and "main on" lamp.

The battery/Charger unit is an integral part of the annunciator panel. It shall be as manufactured by M/s Honeywell or Menvier or other equal and approved and shall be to BS 5839 PTI 1980.

The power supply to the batter/charger unit shall be 240 volts a.c. and shall be derived from an unswitched fused spur unit with neon indicator.

8.05 Annunciator Panels

A 16 way flush mounted addressable fire alarm annunciator panel shall be installed at the ground floor reception area with a mimic panel installed in an agreed position.

The panels shall comprise of a sheet steel cabinet with a stainless steel front plate containing 16 No. indicator lights, mains failure light, zone fault light, bell circuit fault light, red fire light, supervisory buzzer and alarm mute switch. The function of all indicator lights shall be clearly labelled.

The panels shall be as manufactured by M/S Honeywell, Manvier or other equal and approved.

8.06 Break Glass Contacts

Break glass contacts shall be mounted at a height of 1400 f.f.f.l. and shall be suitable for flush mounting.

The unit shall be complete with a black instruction plate engrave "FIRE-SMASH GLASS" and a test button mechanism.

The break glass units shall be as manufactured by Honey Well or other equal and approved.

8.07 Alarm Bells

The alarm bells shall be tangent type "8" diameter suitable for operation in the voltage range 12-24 volts DC as manufactured by M/S Honey Well or other equal and approved.

The bells shall be mounted at a height of 2000mm f.f.f.1. and shall be suitable for mounting on a standard BESA conduit box with terminals capable of accommodating 2 No. 4mm² PVC cables.










8.08 Smoke Detectors

Smoke detectors shall be installed as shown on the Contract Drawings and shall be of ionization chamber type and manufactured by M/S Honey Well, Menvier or other equal and approved.


8.09 Heat Detectors

Where called for, Heat detectors shall be suitable for operation on a closed loop circuitry system and shall comprise of a bi-metal strip and tilting mercury switch tube mounted in a stainless steel body as manufactured by M/s Honey Well, Menvier or other equal and approved.

CPST LIGHT FITTINGS SCHEDULE

No.	TYPE	DESCRIPTION	Lamp Type	AREA OF USAGE	picture	
1	A5	Surface mounted and hanging LED batten luminaire	34W, 3000K colour temperature, 50,000hrs lifetime and DALI dimming with diffuse light quality	Parking area, Staff breakout area, stores		
2	DL1	300 x 300, Downlighter, LED Recessed Mounted	28W, 3000K colour temperature, 50,000hrs lifetime and DALI dimming with diffuse light quality	Washrooms		
3	DL	Enlite EN-DL30/30 30w 2200lm non-dim LED panel 3k Warm White	30W, 3000K, 2600 Lumens, and DALI dimming with diffuse light quality	Offices, corridors, lounges, lobbys		
4	A4	300 X 1200 Coreline panel recessed RC132V LED36S/840 W60L60 ELB3 IAI NOC	34W, 3000 lumens and DALI dimming with diffuse light quality	Auditorium, Library, Indoor sports arena, Aerobics and spin class		
5	ST	Coreline surface-mounted luminaire WL120V	24W, 3000K colour temperature, 50,000hrs lifetime, waterproof and DALI dimming with frosted diffuser	staircases		
6	C	600 X 600 Coreline panel recessed RC132V LED36S/840 W60L60 ELB3 IAI NOC	36W, 3000lumens, 4000K, and DALI dimming with diffuse light quality	Office areas, boardrooms		
7	Em exit	305mm x 160mm x 225mm, ESP EM2WMEXSIGND 2watt LED 3hour Maintained Exit Blade Down Legend	2W, 6000K Colour Temperature 3 Hours Emergency Duration 4.8v 600mAH Battery	Exit entrances and staircase		
8	Em _{na}	389 x 126 x 80mm, Recessed mounting EMLED4WMFLUSH 4W LED Maintained Emergency Flush	4W, 5500K colour temperature, Mains light output - 131 Lumens Emergency light output - 105 Lumens, 3 Hours Emergency Duration	For offices, restaurants, corridors, lounges, lobbys		
9	S	Coreline surface-mounted luminaire WL120V	22W, 3000K colour temperature, 50,000hrs lifetime, waterproof.	Ducts and Lift Shafts		
10	SP	Aurora Enlite EN-MR165/40 MR16 5watt LED 4K Cool White Lamp	22W, 520 Lumens L70 25,000 hours, and DALI dimming with diffuse light quality	Boardrooms and receptions		
11	B	12 W LED Garden Bollard Light	12 Watt warmwhite; 3000K, IP Rating IP64, 50-60Hz, and DALI dimming with diffuse light quality	Garden Lighting		
12	Mirror Light	18 W Dual Voltage White Shaver Light	18W warm white; 240V, IP Rating IP64, 50-60Hz,	Washrooms		
13	Pendant	24 W Cafe Pendant Brushed Steel with Green inner	24W 240V, IP Rating IP64, 50-60Hz,	Restaurants		
12	CR	Firstlight 2314CR Phoenix Pendant Cream	42W warm white; 240V, IP Rating IP64, 50-60Hz,	Guestrooms		To be discussed with The Architect

CPST LIGHT FITTINGS SCHEDULE

No.	TYPE	DESCRIPTION	Lamp Type	AREA OF USAGE	picture	
13	CH	Crystal Pendant Light Fixture Raindrop Chandelier	240W warm white; 240V, IP Rating IP64, 50-60Hz,	Reception areas, entrance areas		To be discussed with The Architect

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
1.0	<u>PRELIMINARIES & CONDITIONS OF CONTRACT</u>				
1.1	Allow for mobilization and setting up stores, tools and all necessary equipment on site	1	Item		
1.2	Allow for co-ordination of works with the Main Contractor and other Sub-contractors	1	Item		
1.3	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	1	Item		
1.4	Arrangement for all inspections and tests of the installation that may be required by the Engineer/Client and shall provide all instruments and equipment required for these tests	1	Item		
1.5	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	1	Item		
1.6	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works.	1	Item		
1.7	Allow for on-site Training of the Operators for specialised equipment	1	Item		
1.8	Allow for all the preliminaries relating to this contract as specified	1	Item		
1.9	Allow for all the conditions relating to this contract as specified	1	Item		
Total of Preliminaries					

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
2.0	INCOMING POWER				
	<u>KPLC RELATED WORKS</u>				
2.1	Allow a P.C. sum(Ksh.10,000,000) for capital contribution towards KPLC incoming supply line and transformer arrangement in to the transformer room and improvements of feeds and new terminations of cut - outs and meters and extension of over-head and underground line and all new installations as necessary.	1	Sum		
2.2	100mm diameter Heavy gauge duct for incoming underground H.V. cables with 1:3:6 concrete surround	600	M		
2.3	900 x 900 x 900 concrete manhole complete with Manhole covers and Hatari(Danger) Sign indelibly engraved at the top	30	No.		
2.4	Trenching , sifting and backfilling the 750mm deep trench after laying the above ducts including compaction	600	M		
2.5	Hatari(Danger) sign concrete slabs	600	No.		
2.6	Attendance on Kenya Power and Lighting Co. Ltd.	1	Sum		
2.7	Complete Earthing system to KPLC requirements	1	Sum		
2.8	Any other item to complete the installation in this section.	1	Sum		
Total for Incoming power installations					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
3.0	<u>MAIN POWER DISTRIBUTION</u>				
3.1	Main Supply Intake Panel <u>Low Voltage Distribution Panel in switchroom</u> Supply, install and commission:- <u>Switch Board</u> Switch board standardized sheet steel (2mm) execution including inscription plate and mounted on a metal support of 100mm Paint: Anti-rust primer:interior of panel RAL 7030 exterior of panel RAL 7030 Mounting The equipment is to be mounted on a light metal frame, with terminals in the section Protection 415V 3 phase with earthing bar Standards The switch board to be in accordance with SEV - standards Voltage Rated voltage 500V 50HZ service voltage 415V 50HZ control voltage 220V 50HZ Busbars Laminated HDHC copper rectangular busbar rated 2000A TYP NS 3D Protection IP 54 rear must be accessible Front doors Back doors Top closed Bases open Power rating 2000 Amps	1	No.		
Total carried forward to next page					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from page				-
3.2	<u>Incoming</u>				
3.2.1	Air Circuit breaker make ABB or approved equivalent, nominal rating 1600A 660V 50HZ breaking capacity 50KA at 440V with over current and short circuit protection inclusive with solid state trip.	2	No.	Included	
3.2.2	Current transformer 1600/ 1 A	2	No.	Included	
3.2.3	Voltage transformer 415/240V BTV 10 with selector switch for all phases	2	No.	Included	
3.2.4	Electronic/ KWH meter similar to ABB or equal and approved	2	No.	Included	
3.3	<u>OUTGOINGS</u>				
	<u>Accomodation Outgoing MCCB</u>				
3.3.1	Moulded case circuit breaker Four pole, breaking capacity 50KA rated 1000A, 660V make ABB or LERGRAND or equal and approved with BMS compatible communicating module	1	No.	Included	
	<u>Conference Outgoing MCCB</u>				
3.3.2	Moulded case circuit breaker Four pole, breaking capacity 50KA rated 1000A, 660V make ABB or LERGRAND or equal and approved with BMS compatible communicating module	1	No.	Included	
	<u>Power Factor Outgoing MCCB</u>				
3.3.3	Moulded case circuit breaker 1 triple pole make ABB type C401H or LEGRAND DPX range or nominal rating , 800A, 660V, breaking capacity 50KA with adjustable thermal trip or equally approved with BMS compatible communicating module	1	No.	Included	
	<u>Switchroom Outgoing MCB</u>				
3.3.4	Moulded case circuit breaker ,Two pole, breaking capacity 50KA rated 32A, 660V make ABB or LERGRAND DPX or equally approved to fire pump panel board with BMS compatible communicating module	1	NO	Included	
	Total carried forward to page No. BQ/5				-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from page No. BQ/6				-
	<u>Spare Outlet Outgoing</u>				
3.3.4	Spare cubicle for future connection for TP MCCB	3	NO	Included	
3.3.5	415V, 50Hz, 2000A 50KA 4 pole copper busbar coupler which is normally kept open complete with all other accessories	1	No.	Included	
	<u>Administration Outgoing MCCB</u>				
3.3.6	Moulded case circuit breaker Four pole, breaking capacity 50KA rated 400A, 660V make ABB or LERGRAND or equal and approved to accomodation rising busbar with BMS compatible communicating module	1	No.	Included	
	<u>Common Outgoing MCCB</u>				
3.3.7	Moulded case circuit breaker Four pole, breaking capacity 50KA rated 630A, 660V make ABB or LERGRAND or equal and approved to conference rising busbar with BMS compatible communicating module	1	No.	Included	
	<u>Power Factor Outgoing MCCB</u>				
3.3.8	Moulded case circuit breaker triple pole make ABB type C401H or LEGRAND DPX range or nominal rating , 800A, 660V, breaking capacity 50KA with adjustable thermal trip or equally approvedwith BMS compatible communicating	1	No.	Included	
	<u>Essential Loads Outgoing MCCB</u>				
3.3.9	Moulded case circuit breaker Triple pole make ABB type C401H or LEGRAND DPX range or nominal rating , 800A, 660V, breaking capacity 50KA with adjustable thermal trip or equally approvedwith BMS compatible communicating	1	No.	Included	
	<u>Spare Outlet Outgoing</u>				
3.3.10	Spare cubicle for future connection for TP MCCB	3	NO	Included	-
3.3.11	Change Over switch comprising of 2No. 1600 A 4P motorised ACB, Electromechanical interlocked, complete with microprocessor, electronic trip, manual /bypass with BMS compatible communicating module	2	NO	Included	
3.3.12	Change Over switch comprising of 2No. 800 A 4P motorised ACB, Electromechanical interlocked, complete with microprocessor, electronic trip, manual /bypass with BMS compatible communicating module	1	NO	Included	
	Total carried forward to page No. BQ/5				-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
3.4	<p>Total brought forward from previous page</p> <p><u>Power Factor Correction Panel In</u></p> <p><u>Switchroom</u></p> <p>Supply and install the following:-</p> <p>Constructed from rolled steel angle channel section welded to form robust structure with deta-chable 16 gauge plates to SEV - standards mounted on B198 Sheet1 Sheet1metal support of Sheet1</p> <p>Front doors Back doors Top closed Bases open</p> <p>Paint: Anti-rust primer interior of panel RAL 7030 , exterior of panel RAL 7030 Mounting To be mounted on light frame, with terminals in the lower section</p> <p>Protection 415V 3 phase with earthing bar</p> <p>Voltage Rated voltage 500V 50HZ service voltage 415V 50HZ</p> <p>Busbars Laminated HDHC copper busbar rating 1600A rectangular conductor</p>	2	No.	Included	-
3.5	<u>Metering</u>				
3.5.1	Current transformer self-cooled rating 800/5A				
3.5.2	Power factor meter direct reading range - 0.5 capacitive of built in series resistors TYPE SIEMENS M01055 - D3590				
3.5.3	Power factor regulator 2 steps of 100, 3 steps of 50, 2 steps of 25, 3 steps of 10 and 4 steps of 5 controller similar to siemens electronic KVAR controller type 4RY81 01 3DA01 supply voltage 415V 50HZ				
3.5.4	Power factor correction unit comprising of 2 step 100KVA capacitor, 3 steps of 50KVA capacitor, 2 step 25KVA capacitor, 3 step 10KVA capacitor and 4 step 5KVA capacitor banks, current transformers and control cables				
Total for Main LV Board					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
4	<u>SUB MAIN BOARDS AND CABLES</u>				
	Supply and install the following:-				
4.1	400mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from KPLC transformer to Generator and the main switchboard complete with cable glands and lugs as shown in the contract drawing.	980	LM		
4.2	1000A TPN+E, 600V, 36kA, Rising main busbars in 2 hour fire rated enclosures complete with the 1000A TPN+E system end-feed unit, phase insulation and withdrawable tap-off units 33No. 125A TP+N as Merlin Gerin or equal and approved complete with all switchgear accessories - accomodation duct	45	LM		
4.3	400mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from LV board to accomodation rising busbars complete with cable glands and lugs	820	LM		
4.4	1000A TPN+E, 600V, 36kA, Rising main busbars in 2 hour fire rated enclosures complete with the 1000A TPN+E system end-feed unit, phase insulation and withdrawable tap-off units 33No. 125A TP+N as Merlin Gerin or equal and approved complete with all switchgear accessories - accomodation duct	40	LM		
4.5	400mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from LV board to accomodation rising busbars complete with cable glands and lugs	580	LM		
4.6	Surface mount powder coated, Form 3B Sub Main Board, Comprising of:- 400A TP MCCB incomer, 3No.indicating lambs with 10No. 125A TP MCCB and 2No. blanked/Spare Ways (Administration board).	1	No.		
4.7	240mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from LV board to administration board complete with cable glands and lugs	480	LM		
Total carried forward to page No. BQ/5					

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from previous page				
4.8	Surface mount powder coated, Form 3B Sub Main Board, Comprising of:- 630A TP MCCB incomer, 3No.indicating lambs with 12No. 125A TP MCCB and 2No. blanked/Spare Ways (Common area board).	1	No.		
4.9	240mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from LV board to common area board complete with cable glands and lugs	580	LM		
4.10	Surface mount powder coated, Form 3B Sub Main Board, Comprising of:- 800A TP MCCB incomer, 3No.indicating lambs with 10No. 125A TP MCCB and 2No. blanked/Spare Ways (Essential Loads board).	1	No.		
4.11	240mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from LV board to Essential loads board complete with cable glands and lugs	480	LM		
Total for Sub Main Boards and cables Installations					

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
5.0	<u>DISTRIBUTION BOARDS AND CABLES</u>				
5.1	BESEMENT Supply and install the following:-				
5.1.2	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	7	No.		
5.1.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	280	M		
5.2	GROUND FLOOR				
5.2.1	Surface mount powder coated, Form 3B Sub Main Board, Comprising of:- 400A TP MCCB incomer, 3No.indicating lambs with 3No. 125A TP MCCB and 3No. blanked/Spare Ways (Kitchen board).	1	No.		
5.2.2	240mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench from rising busbar to kitchen board complete with cable glands and lugs	240	LM		
5.2.3	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	7	No.		
5.2.4	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.2.5	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	280	M		
5.2.6	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	250	M		
Total carried forward to page No. BQ/12					

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from page No. BQ/11				
5.3	FIRST FLOOR Supply and install the following:-				
5.3.1	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.3.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	18	No.		
5.3.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.3.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	540	M		
5.4	SECOND FLOOR Supply and install the following:-				
5.4.1	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.4.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	18	No.		
5.4.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.4.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	540	M		
Total carried forward to page No. BQ/12					

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from page No. BQ/11				
5.5	THIRD FLOOR Supply and install the following:-				
5.5.1	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.5.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	18	No.		
5.5.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.5.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	540	M		
5.6	FOURTH FLOOR Supply and install the following:-				
5.6.1	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.6.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	14	No.		
5.6.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.6.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	420	M		
Total carried forward to page No. BQ/13					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from page No. BQ/12				
5.7	FIFTH FLOOR				
	Supply and install the following:-				
5.7.1	8 way 125A TPN DB 1& 2 flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.7.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	14	No.		
5.7.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.7.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	420	M		
5.8	SIXTH FLOOR				
	Supply and install the following:-				
5.8.1	8 way 125A TPN DB 1& 2 flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	5	No.		
5.8.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	14	No.		
5.8.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.8.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	420	M		
	Total carried forward to page No. BQ/14				-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
	Total brought forward from page No. BQ/13				
5.9	SEVENTH FLOOR Supply and install the following:-				
5.9.1	8 way 125A TPN DB flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling DB 1 or equal and approved.	5	No.		
5.9.2	6 way 100A SPN CU flush mounted as ABB complete with Isolator switch and MCBs and blanking plates including bonding and labeling or equal and approved.	8	No.		
5.9.3	35.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	200	M		
5.9.4	10.0 mm ² 3core XLPE /SWA/ CU cables c/w lugs and glands	240	M		
Total for distribution boards					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					SHS.
6	<u>ISOLATORS AND CABLE</u> Supply and install the following:-				
6.1	32A SPN Isolators for HVAC and mechanical loads	350	No.		
6.2	63A TPN Isolators	100	No.		
6.3	4.0 mm ² 3 core XLPE /SWA/ CU cables c/w lugs and glands	7000	M		
6.4	16.0 mm ² 4 core XLPE /SWA/ CU cables c/w lugs and glands	2000	M		
Total for Isolators and cabling					-

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
7.0	<u>LIGHTING</u>				
7.1	BASEMENT LEVEL 098				
	Supply and install the following:-				
7.1.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	215	No.		
7.1.2	10A switches as MK Slim line or equivalent.	10	No.		
	Luminaires as listed below:-				
7.1.3	A5	160	No.		
7.1.4	Emm	25	No.		
7.1.5	S	7	No.		
7.1.6	EXIT	10	No.		
7.1.7	PIR Motion Switch	13	No.		
Total carried forward to page No. BQ/18					-

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/17				-
7.1	GROUND FLOOR Supply and install the following:- All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.				
7.1.1		583	No.		
7.1.2	10A switches as MK Slim line or equivalent. Luminaires as listed below:-	60	No.		
7.1.3	A5	50	No.		
7.1.4	P	21	No.		
7.1.5	CH	15	No.		
7.1.6	SP	22	No.		
7.1.7	S	7	No.		
7.1.8	EXIT	10	No.		
7.1.9	DL	99	No.		
7.1.10	DL1	145	No.		
7.1.11	C	15	No.		
7.1.12	CR	5	No.		
7.1.13	B	33	No.		
7.1.14	ST_EM	15	No.		
7.1.15	PIR Motion Switch	59	No.		
7.1.16	EMm	38	No.		
7.1.17	EMnm	10	No.		
7.1.18	WB	42	No.		
7.1.19	M	21	No.		
7.1.20	SG	46	No.		
7.1.21	PL	70	No.		
	Total carried forward to page No. BQ/19				

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/18				
7.2	FIRST FLOOR				
	Supply and install the following:-				
7.2.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	449	No.		
7.2.2	10A switches as MK Slim line or equivalent.	105	No.		
	Luminaires as listed below:-				
7.2.3	A5	3	No.		
7.2.4	SP	10	No.		
7.2.5	S	7	No.		
7.2.6	EXIT	8	No.		
7.2.7	DL	201	No.		
7.2.8	DL1	89	No.		
7.2.9	C	13	No.		
7.2.10	CR	34	No.		
7.2.11	ST_EM	15	No.		
7.2.12	PIR Motion Switch	40	No.		
7.1.13	EMm	60	No.		
7.1.14	EMnm	5	No.		
7.1.15	M	25	No.		
	Total carried forward to page No. BQ/19				

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/19				
7.3	SECOND FLOOR				
	Supply and install the following:-				
	Supply and install the following:-				
7.3.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	554	No.		
7.3.2	10A switches as MK Slim line or equivalent.	155	No.		
	Luminaires as listed below:-				
7.3.3	A5	9	No.		
7.3.4	S	7	No.		
7.3.5	EXIT	8	No.		
7.3.6	DL	293	No.		
7.3.7	DL1	47	No.		
7.3.8	C	79	No.		
7.3.9	CR	17	No.		
7.3.10	ST_EM	10	No.		
7.3.11	WB	40	No.		
7.3.12	PIR Motion Switch	25	No.		
7.3.13	EMm	79	No.		
7.3.14	EMnm	5	No.		
7.3.15	M	23	No.		
Total carried forward to page No. BQ/21					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/20				
7.4	THIRD FLOOR Supply and install the following:- Supply and install the following:-				
7.4.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	437	No.		
7.4.2	10A switches as MK Slim line or equivalent. Luminaires as listed below:-	105	No.		
7.4.3	A5	9	No.		
7.4.4	S	7	No.		
7.4.5	EXIT	8	No.		
7.4.6	DL	105	No.		
7.4.7	DL1	62	No.		
7.4.8	C	68	No.		
7.4.9	CR	19	No.		
7.4.10	ST_EM	12	No.		
7.4.11	WB	18	No.		
7.4.12	SP	17	No.		
7.4.13	A4	20	No.		
7.4.14	PIR Motion Switch	28	No.		
7.4.15	EMm	59	No.		
7.4.16	EMnm	5	No.		
7.4.17	M	29	No.		
	Total carried forward to page No. BQ/22				

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/21				
7.5	FORTH FLOOR Supply and install the following:-				
7.5.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	521	No.		
7.5.2	10A switches as MK Slim line or equivalent.	153	No.		
	Luminaires as listed below:-				
7.5.3	A5	17	No.		
7.5.4	S	7	No.		
7.5.5	EXIT	8	No.		
7.5.6	DL	106	No.		
7.5.7	DL1	61	No.		
7.5.8	C	96	No.		
7.5.9	CR	28	No.		
7.5.10	ST_EM	12	No.		
7.5.11	WB	31	No.		
7.5.12	SP	78	No.		
7.5.13	A4	16	No.		
7.5.14	CH	1	No.		
7.5.15	PIR Motion Switch	19	No.		
7.1.16	EMm	81	No.		
7.1.17	EMnm	5	No.		
7.1.18	M	21	No.		
	Total carried forward to page No. BQ/23				

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/22				
7.6	FIFTH FLOOR				
7.6.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	559	No.		
7.6.2	10A switches as MK Slim line or equivalent.	155	No.		
	Luminaires as listed below:-				
7.6.3	A5	12	No.		
7.6.4	S	7	No.		
7.6.5	EXIT	8	No.		
7.6.6	DL	150	No.		
7.6.7	DL1	53	No.		
7.6.8	C	136	No.		
7.6.9	CR	27	No.		
7.6.10	ST_EM	10	No.		
7.6.11	WB	13	No.		
7.6.12	SP	40	No.		
7.6.13	PIR Motion Switch	38	No.		
7.6.14	EMm	58	No.		
7.6.15	EMnm	7	No.		
7.6.16	M	19	No.		
Total carried forward to page No. BQ/24					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/23				
7.7	SIXTH FLOOR				
	Supply and install the following:-				
7.7.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	457	No.		
7.7.2	10A switches as MK Slim line or equivalent.	155	No.		
	Luminaires as listed below:-				
7.7.3	A5	17	No.		
7.7.4	S	7	No.		
7.7.5	EXIT	8	No.		
7.7.6	DL	83	No.		
7.7.7	DL1	97	No.		
7.7.8	CR	42	No.		
7.7.9	ST_EM	10	No.		
7.7.10	WB	14	No.		
7.7.11	A4	89	No.		
7.7.12	C	8	No.		
7.7.13	PIR Motion Switch	29	No.		
7.7.14	EMm	48	No.		
7.7.15	EMnm	5	No.		
7.7.16	M	28	No.		
	Total carried forward to page No. BQ/24				

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					K.SHS.
7.8	Total brought forward from page No. BQ/23 SEVENTH FLOOR Supply and install the following:-				
7.8.1	All switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø. HG PVC conduits concealed in building fabrics.	337	No.		
7.8.2	10A switches as MK Slim line or equivalent.	155	No.		
	Luminaires as listed below:-				
7.8.3	A5	40	No.		
7.8.4	S	7	No.		
7.8.5	EXIT	8	No.		
7.8.6	DL	56	No.		
7.8.7	DL1	69	No.		
7.8.8	CR	37	No.		
7.8.9	ST_EM	10	No.		
7.8.10	P	39	No.		
7.8.11	PIR Motion Switch	22	No.		
7.8.12	EMm	30	No.		
7.8.13	EMnm	5	No.		
7.8.14	WB	14	No.		
7.8.15	M	26	No.		
Total for Lighting Installations					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
8.1	POWER CABLE TRAYS BASEMENT				
	Supply and install the following:-				
8.1.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.1.2	Stright Sections	400	M		
8.1.3	Tee Junctions	20	No.		
8.1.4	Crossings	7	No.		
8.1.5	Bends	7	No.		
8.2	GROUND FLOOR				
	Supply and install the following:-				
8.2.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.2.2	Stright Sections	150	M		
8.2.3	Tee Junctions	15	No.		
8.2.4	Crossings	4	No.		
8.2.5	Bends	4	No.		
8.3	FIRST FLOOR				
8.3.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.3.2	Stright Sections	150	M		
8.3.2	Tee Junctions	20	No.		
8.3.3	Crossings	5	No.		
8.3.4	Bends	5	No.		
Total carried forward to page No. BQ/27					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/26				
8.4	SECOND FLOOR				
	Supply and install the following:-				
8.4.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.4.2	Stright Sections	150	M		
8.4.3	Tee Junctions	25	No.		
8.4.4	Crossings	6	No.		
8.4.5	Bends	6	No.		
8.5	THIRD FLOOR				
	Supply and install the following:-				
8.5.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.5.2	Stright Sections	150	M		
8.5.3	Tee Junctions	15	No.		
8.5.4	Crossings	10	No.		
8.5.5	Bends	10	No.		
8.6	FORTH FLOOR				
	Supply and install the following:-				
8.6.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.6.2	Stright Sections	150	M		
8.6.3	Tee Junctions	15	No.		
8.6.4	Crossings	10	No.		
8.6.5	Bends	10	No.		
Total carried forward to page No. BQ/27					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/26				
8.7	FIFTH FLOOR				
	Supply and install the following:-				
8.7.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.7.2	Stright Sections	150	M		
8.7.3	Tee Junctions	15	No.		
8.7.4	Crossings	10	No.		
8.7.5	Bends	10	No.		
8.8	SIXTH FLOOR				
	Supply and install the following:-				
8.8.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.8.2	Stright Sections	150	M		
8.8.3	Tee Junctions	10	No.		
8.8.4	Crossings	5	No.		
8.8.5	Bends	5	No.		
8.9	SEVENTH FLOOR				
	Supply and install the following:-				
8.9.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
8.9.2	Stright Sections	100	M		
8.9.3	Tee Junctions	10	No.		
8.9.4	Crossings	5	No.		
8.9.5	Bends	5	No.		
Total for power cable trays installations					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
9.1	TELECOMMUNICATION CABLE TRAY GROUND FLOOR				
	Supply and install the following:-				
9.1.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.1.2	Stright Sections	100	M		
9.1.3	Tee Junctions	30	No.		
9.1.4	Crossings	8	No.		
9.1.5	Bends	8	No.		
9.2	FIRST FLOOR				
9.2.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.2.2	Stright Sections	150	M		
9.2.3	Tee Junctions	40	No.		
9.2.4	Crossings	10	No.		
9.2.5	Bends	10	No.		
9.3	SECOND FLOOR				
	Supply and install the following:-				
9.3.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.3.2	Stright Sections	165	M		
9.3.3	Tee Junctions	15	No.		
9.3.4	Crossings	6	No.		
9.3.4	Bends	6	No.		
Total carried forward to page No. BQ/31					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/30				
9.4	THIRD FLOOR				
	Supply and install the following:-				
9.4.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.4.2	Stright Sections	180	M		
9.4.2	Tee Junctions	20	No.		
9.4.3	Crossings	5	No.		
9.4.4	Bends	5	No.		
9.5	FORTH FLOOR				
	Supply and install the following:-				
9.5.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.5.2	Stright Sections	200	M		
9.5.3	Tee Junctions	15	No.		
9.5.4	Crossings	5	No.		
9.5.5	Bends	5	No.		
9.6	FIFTH FLOOR				
	Supply and install the following:-				
9.6.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.6.1	Stright Sections	225	M		
9.6.2	Tee Junctions	15	No.		
9.6.3	Crossings	5	No.		
9.6.4	Bends	5	No.		
Total carried forward to page No. BQ/29					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/28				
9.7	SIXTH FLOOR				
	Supply and install the following:-				
9.7.7	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.7.1	Stright Sections	200	M		
9.7.2	Tee Junctions	15	No.		
9.7.3	Crossings	5	No.		
9.7.4	Bends	5	No.		
9.8	SEVENTH FLOOR				
	Supply and install the following:-				
9.8.1	CABLE TRAY: 200 x 50mm galvanised steel factory fabricated Cable tray.				
9.8.2	Stright Sections	200	M		
9.8.3	Tee Junctions	10	No.		
9.8.4	Crossings	10	No.		
9.8.5	Bends	10	No.		
Total for ELV Cable Trays					

ITEM	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
					K.SHS.
10.0	<u>SMALL POWER DISTRIBUTION</u> BASEMENT & GROUND FLOOR Supply and install the following:- All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet				
10.1.1		140	No.		
10.1.2	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.1.3	16A, 2P + E Industrial type unswitched socket outlet c/w matching plugs (IP65) for IT rack.	4	No.		
10.1.4	FARP: Outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit for the Fire Alarm Control Panel with 13A fused, switched DP control switch	2	No.		
10.1.4	COOKER UNIT: Hand drier outlet point wired in 3 x 6.0mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with Cooker outlet	20	No.		
10.1.5	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	130	No.		
10.1.6	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	130	No.		
10.1.7	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	450	No.		
10.1.8	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	45	No.		
10.1.9	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	10	No.		
Total carried forward to page No. BQ/36					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/35				
10.2	FIRST FLOOR				
	Supply and install the following:-				
10.2.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	578	No.		
10.2.2	16A, 2P + E Industrial type unswitched socket outlet c/w matching plugs (IP65) for IT rack.	4	No.		
10.2.3	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.2.4	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation				
10.2.5	DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	568	No.		
10.2.6	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	200	No.		
10.2.7	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	200	No.		
10.2.8	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.2.9	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
10.2.9	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
Total carried forward to page No. BQ/36					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/37				
10.3	SECOND FLOOR Supply and install the following:-				
10.3.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	250	No.		
10.3.2	16A, 2P + E Industrial type unswitched socket outlet c/w matching plugs (IP65) for IT rack.	4	No.		
10.3.3	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.3.4	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	200	No.		
10.3.5	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	200	No.		
10.3.6	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	220	No.		
10.3.7	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	28	No.		
10.3.8	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.3.9	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
Total carried forward to page No. BQ/36					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/34				
10.4	THIRD FLOOR				
10.4.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	390	No.		
10.4.2	16A, 2P + E Industrial type unswitched socket outlet c/w matching plugs (IP65) for IT rack.	4	No.		
10.4.3	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.4.4	Floor box (1 no twin socket, 1 no single data & 1 no telephone outlet)	10	No.		
	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation				
10.4.5	DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	380	No.		
10.4.6	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	200	No.		
10.4.7	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	230	No.		
10.4.8	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	25	No.		
10.4.8	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.4.9	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	25	No.		
Total carried forward to page No. BQ/38					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/37				
10.5	FORTH FLOOR				
	Supply and install the following:-				
10.5.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	380	No.		
10.5.2	16A, 2P + E Industrial type unswitched socket outlet c/w matching plugs (IP65) for IT rack.	4	No.		
10.5.3	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.5.4	Floor box (1 no twin socket, 1 no single data & 1 no telephone outlet)	80	No.		
	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation				
10.5.5	DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	300	No.		
10.5.6	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	200	No.		
10.5.7	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	230	No.		
10.5.8	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
10.5.9	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.5.10	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	25	No.		
	Total carried forward to page No. BQ/38				

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/34				
10.6	FIFTH FLOOR Supply and install the following:-				
10.6.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	200	No.		
10.6.2	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.6.3	Floor box (1 no twin socket, 1 no single data & 1 no telephone outlet)	110	No.		
	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation				
10.6.4	DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	120	No.		
10.6.5	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	100	No.		
10.6.6	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	230	No.		
10.6.7	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
10.6.8	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.6.9	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	40	No.		
Total carried forward to page No. BQ/38					-

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/34				
10.7	Supply and install the following:- SIXTH FLOOR				
10.7.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	200	No.		
10.7.1	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.7.2	Floor box (1 no twin socket, 1 no single data & 1 no telephone outlet)	15	No.		
	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation				
10.7.3	DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	80	No.		
10.7.4	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	40	No.		
10.7.5	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	180	No.		
10.7.6	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
10.7.7	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.7.8	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
Total carried forward to page No. BQ/38					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/34				
10.8	SEVENTH FLOOR				
10.8.1	All socket outlet points wired in 2.5mm ² PVC cable in conduit embedded in floor slabs and in metal trunking complete with 13A twin socket outlet	160	No.		
10.8.2	HAND DRIERS: Hand drier outlet point wired in 3 x 2.5mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with 13A fused, switched DP control switch	10	No.		
10.8.3	COOKER UNIT: Hand drier outlet point wired in 3 x 6.0mm ² PVC insulated single core copper cables in 20mm HG PVC conduit with Cooker outlet	8	No.		
10.8.4	Conduiting and provision for Data, Fire alarm, CCTV and Voice evacuation DATA POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	100	No.		
10.8.5	TELEPHONE POINTS Outlets for Data & Voice provided in 25mm Ø HG PVC conduit c/w draw wire and single switch box. <i>(should radiate from the LAN cabinet).</i>	50	No.		
10.8.6	FIRE ALARM: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	180	No.		
10.8.7	TV: Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	30	No.		
10.8.8	CCTV: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
10.8.9	ACCESS CONTROL: Outlets for Cameras interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	20	No.		
Total for small power installations					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
11.0	<u>EARTHING</u>				
	Supply and install the following:-				
11.1	Earth Potential Copper Bar measuring 1200m long X 50mm Wide X 6mm Thick, mounted on insulators in room	10	No.		
11.2	Earth Potential Copper Bar measuring 600m long X 50mm Wide X 6mm Thick, mounted on insulators in room	20	No.		
11.3	16mm sq SC CU cable c/w appropriate cable glands, cable lugs	400	M		
11.4	95mm sq SC CU cable c/w appropriate cable glands, cable lugs	800	M		
11.5	Earth pits c/w earth matt and earth rods	40	No.		
Total carried forward to page No. BQ/38					

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
	Total brought forward from page No. BQ/34				
	<u>LIGHTNING PROTECTION</u>				
	Supply and install the following:-				
11.6	Air Termination including the spike terminal, copper rod and clamp	8	No.		
	Down Conductor				
11.7	25 x 3mm copper tape	980	LM		
11.8	Tape clip	980	No.		
11.9	Junction clamp	100	No.		
11.10	38mm diameter HG PVC pipe	320	LM		
11.11	Testing Joints	100	No.		
11.12	Earth Termination	8	No.		
11.13	15mm diameter, 4 meter length Copper Earth rod to be buried a depth of 5m below ground and spaced horizontally 3.5 meters apart in basement level	8	No.		
11.14	Earth Treatment and Bonding	8	Item		
11.15	Testing and commissioning of all the installations	1	Lot.		
11.16	Any other item to complete installation in this section (specify)	1	Sum		
Total for Earthing and lightning protection					-

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
12.0	<u>AUTOMATIC VOLTAGE STABILIZER</u>				
	Supply, Install test and commission the following				
12.1	100kVA 3 phase voltage stabilizer with input voltage variation range of 415V (+/- 15%) and selectable output voltage 220-230-240V (L-N) and 380-400-415V (L-L) with control and stabilization managed by digital microprocessor. (Please indicate the model name and country of origin)	2	No.		
12.2	400mm ² PVC/SWA/PVC single core armoured copper cable runs laid in trench between the voltage stabilizer and the bypass switch panel within the main LV Switch board complete with cable glands and lugs	480	M		
12.3	95mm ² Earth continuity copper conductor enclosed in 38mm diameter HG PVC concealed conduit complete with fixings at the stabilizer, bypass and at the earthing mats including terminations	60	M		
Total for AVS installations					-

ITEM	DESCRIPTION	Qty	UNIT	RATE (KSH)	AMOUNT (KSH)
13.0	<u>UPS</u>				
	Supply, Install test and commission the following				
13.1	100KVA UPS UNIT: UPS Unit c/w Battery back-up for 15 minute and the bypass switch	4	No.		
13.2	10KVA UPS UNIT: UPS Unit c/w Battery back-up for 15 minute and the bypass switch	4	No.		
13.3	Preliminaries, Installation, Testing and Commissioning	1	Lot		
Total for UPS installations					-

ITEM	DESCRIPTION				AMOUNT (KSH)
14.0	<p align="center"><u>STREET LIGHTING</u></p> <p>Supply, Install test and commission the following</p>				
14.1	<p>8 meters above finished foot path level, circular street lighting column made from 3mm thick steel galvanized pipe complete with single arm entry bracket of 1.0 meters outreach at an angle of 45 degrees, 100w LED solar street lights, IP65 waterproof level, 6000k color temperature, 200AH Gel battery capacity in waterproof pvc box and outer galvanized steel cage, 250W monoproduct and 12V charge controller complete with dc cable and other accessories.</p>	40	No.		
Total for Street lighting					-

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KSH)	AMOUNT (KSH)
15.0	<u>TRANSFORMERS</u>				
	Supply, Install test and commission the following				
15.1	Free standing 11KV, 50Hz, 400A VCB Breaker incomer HT compact Ring main unit (RMU) complete with 11KV, 2No. 200A VCB outgoing cubicle disconnect switches & Relay with RS485 modbus output for BMS monitoring as per attached drawing. (Please indicate the model name and country of origin)	NO.	1		
15.2	1500KVA 11kv/415V 50Hz 3ph, ground mounted Dyn-11 transformer, Dry Type with Enclosure and wheels for ground movement. Allow for Transformer Relay & Auxilliary terminals for Control Cables. (Please indicate the model name and country of origin)	NO.	2		
15.3	3C, 95mm ² copper cable of voltage rating 11kv, XLPE, PVC/SWA/PVC insulated copper cable from KPLC Metering Breaker to Ring main unit and to Transformer	Lm	60		
15.4	Transformer grounding 25x3mm copper tape complete with clips	lm	40		
15.5	Bonding of copper tape from transformer star point to Earth Mat	item	2		
15.6	Earthing comprising of copper earth mat in lattice configuration 1000mmx1000mm. Conductor size of lattice 25x3mm with tail to tie copper tape.	item	2		
15.7	Excavation for copper earth mat not less than 1.5m, laying of mat, enhancement of ground with dust coal & red soil and backfilling	item	2		
15.8	Transformer & RMU tests and inspections Provide all Factory & On site Test results for standard IEC 60076 tests to KPLC Requirements	item	1		
Total for Transformers					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
	SOLAR PV INSTALLATION Supply, install, test and commission a complete solution as described below: -				
16.1	585Wp Ultra-high power monocrystalline solar PV modules	528	No.		
16.2	82.8kw solar inverters	4	No.		
16.3	Power Optimizers	4	No.		
16.4	Roof top mounting structures for PV module	1	No.		
16.5	Weather station comprising irradiance sensor, module temperature sensor , wind sensor and ambient temperature sensor	1	No.		
16.6	Cabling and accessories	1	Lot		
16.7	Energy Meter	1	No.		
16.8	Firefighter gateway	1	No.		
16.9	Low voltage synchronization panel	1	No.		
16.10	Smart battery storage system	1	Lot		
16.11	SMA battery inverter, accossiated cabling and main switch	1	No.		
16.12	PV plant earthing and bonding	1	No.		
16.13	Configuration, testing and commissioning	1	Lot		
16.14	Demonstration of system performance and training	1	No.		
16.15	Mandatory spare parts and tools	1	Lot		
16.16	Online monitoring system	1	No.		
16.17	O&M manuals, training and maintenance during the Defects Liability Period	1	No.		
16.18	Any other item recommended by Tenderer to make the installation complete and functional:-	1	Lot		
Total for solar PV Installations					

ITEM	DESCRIPTION	AMOUNT SHS.
MAIN SUMMARY PAGE		
1	Total of Preliminaries	
2	Total for Incoming power installations	
3	Total for Main LV Board Installations	
4	Total for Sub Main Boards Installations	
5	Total for distribution boards	
6	Total for Isolators and cabling	
7	Total for Lighting	
8	Total for Power Cable Trays	
9	Total for ELV Cable Trays	
10	Total for small power installations	
11	Total for Earthing and Lighting installations	
12	Total for AVS installations	
13	Total for UPS Installations	
14	Total for street lighting	
15	Total for Transformers	
16	Pc Sum For Enhance Lighting Ksh 10,000,000.00	10,000,000.00
17	Total for 300KWp Solar Power	-
	TOTAL	

FIRE DETECTION AND ALARM SYSTEM
(SPECIFICATIONS)

1. FIRE DETECTION AND ALARM SYSTEM SPECIFICATION

1.1. INTELLIGENT REPORTING FIRE DETECTION SYSTEM

1.1.1. DESCRIPTION

- i. The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.
- ii. The facility shall have an emergency voice alarm communication system. Digitally stored message sequences shall notify the building occupants that a fire or life safety condition has been reported. Message generator(s) shall be capable of automatically distributing up to eight (8) simultaneous, unique messages to appropriate audio zones within the facility based on the type and location of the initiating event. The Fire Command Center (FCC) shall also support Emergency manual voice announcement capability for both system wide or selected audio zones, and shall include provisions for the system operator to override automatic messages system wide or in selected zones.
- iii. The system shall be support additional, alternate Fire Command Centers, which shall be capable of simultaneous monitoring of all system events. Alternate Fire Command Centers shall also support an approved method of transferring the control functions to an alternate Fire Command Center when necessary. All Fire Command Centers shall be individually capable of assuming Audio Command functions such as Emergency Paging, audio zone control functions, and Firefighter's Telephone communication functions.
- iv. Each designated zone shall transmit separate and different alarm, supervisory and trouble signals to the Fire Command Center (FCC) and designated personnel in other buildings at the site via a multiplex communication network
- v. The FACP and peripheral devices shall be manufactured 100% by a single manufacturer (or division of the same).
- vi. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall comply with the UL listing.

- vii. The installing company shall employ NICET (minimum Level II Fire Alarm Technology) technicians on site to guide the final checkout and to ensure the systems integrity.

1.1.2. SCOPE:

A new intelligent reporting, microprocessor controlled fire detection system shall be installed in accordance to the project specifications and drawings.

Basic Performance:

- i. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 4 (Class B) Signaling Line Circuits (SLC).
- ii. Device Circuits (IDC) shall be wired Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.
- iii. Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.
- iv. On Style 6 or 7 (Class A) configurations a single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
- v. Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.
- vi. Speaker circuits may be controlled by NAC outputs built into the amplifiers, which shall function as addressable points on the Digital Audio Loop.
- vii. NAC speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone whichever is greater.
- viii. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.
- ix. NAC speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.
Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.
Speaker circuits shall be arranged such that there is a minimum of one speaker circuit per smoke zone.

Speaker circuits shall be electrically supervised for open and short circuit conditions. If a short circuit exists on a speaker circuit, it shall not be possible to activate that circuit.

- x. Audio amplifiers and tone generating equipment shall be electrically supervised for abnormal conditions. Digital amplifiers shall provide built-in speaker circuits, field configurable as four Class B (Style Y), or two Class A (Style Z) circuits.
- xi. Digital amplifiers shall be capable of storing up to two minutes of digitally recorded audio messages and tones. The digital amplifiers shall also be capable of supervising the connection to the associated digital message generator, and upon loss of that connection shall be capable of one of the following system responses:
 - a. The digital amplifier shall automatically broadcast the stored audio message.
 - b. The digital amplifier shall switch to a mode where a local bus input on the digital amplifier will accept an input to initiate a broadcast of the stored message. This bus input shall be connected to a NAC on a local FACP for providing an alternate means of initiating an emergency message during a communication fault condition.
 - c. Speaker circuits shall be either 25 VRMS or 70VRMS. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements.
 - d. Two-way emergency telephone (Fire Fighter Telephone) communication shall be supported between the Audio Command Center and up to seven (7) remote Fire Fighter's Telephone locations simultaneously on a telephone riser.
 - e. Means shall be provided to connect FFT voice communications to the speaker circuits in order to allow voice paging over the speaker circuit from a telephone handset.
 - f. The digital audio message generator shall be of reliable, non-moving parts, and support the digital storage of up to 32 minutes of tones and emergency messages, shall support programming options to string audio segments together to create up to 1000 messages, or to loop messages and parts of messages to repeat for pre-determined cycles or indefinitely.

1.1.3. GUARANTY:

The fire alarm control panel, voice panels and any head-end equipment shall have a manufacturer's warranty of a minimum of 3 years.

1.1.4. POST CONTRACT MAINTENANCE:

- i. Complete maintenance and repair service for the fire detection system shall be available from a factory trained authorized representative of the manufacturer of the major equipment for a period of five (5) years after expiration of the guaranty.
- ii. As part of the bid/proposal, include a quote for a maintenance contract to provide all maintenance, required tests, and list pricing for any replacement products included on the bill of materials, along with the list pricing for products not on the bill of materials; if test and inspection rates are different than full service rates the bid/proposal shall include pricing for all levels for a minimum period of five (5) years Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.
- iii. Include also a quote for unscheduled maintenance/repairs, including hourly rates for technicians trained on this equipment, and response travel costs for each year of the maintenance period. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.

1.1.5. APPLICABLE STANDARDS AND SPECIFICATIONS:

- i. The specifications and standards listed below form a part of this specification. The system shall fully comply with the latest issue of these standards, if applicable.
- ii. National Fire Protection Association (NFPA):

No. 12	Extinguishing Systems (low and high)
No. 12A	Halon 1301 Extinguishing Systems
No. 13	Sprinkler Systems

No. 15	Water Spray Systems
No. 16	Foam / Water Deluge and Spray Systems
No. 17	Dry Chemical Extinguishing Systems
No. 17A	Wet Chemical Extinguishing Systems
No. 2001	Clean Agent Extinguishing Systems
No. 70	National Electric Code
No. 90A	Air Conditioning Systems
No. 92A	Smoke Control Systems
No. 92B	Smoke Management Systems in Malls, Atria, Large Areas
No. 72	National Fire Alarm Code
No. 101	Life Safety Code

iii. Underwriters Laboratories Inc. (ULFM):

No. 268	Smoke Detectors for Fire Protective Signaling Systems
No. 864	Control Units for Fire Protective Signaling Systems
No. 2572	Mass Notification Systems
No. 217	Smoke Detectors, Single and Multiple Station
No. 228	Door Closers - Holders for Fire Protective Signaling Systems
No. 268A	Smoke Detectors for Duct Applications
No. 521	Heat Detectors for Fire Protective Signaling Systems
No. 464	Audible Signaling Appliances
No. 38	Manually Actuated Signaling Boxes
No. 1481	Power Supplies for Fire Protective Signaling Systems
No. 346	Waterflow Indicators for Fire Protective Signaling Systems
No. 1076	Control Units for Burglar Alarm Proprietary Protective Signaling Systems
No. 1971	Visual Notification Appliances

No. 2017	Standard for General-Purpose Signaling Devices and Systems
No.60950	Safety of Information Technology Equipment

- iv. Local Building Codes.
The Kenya Bureau of Standards codes for building will be used
- v. All requirements of the Authority Having Jurisdiction (AHJ).

1.1.6. APPROVALS:

- i. The system shall have proper listing and/or approval from the following nationally recognized agencies:

NMS	Nairobi Metropolitan Service
UL	Underwriters Laboratories
FM	Factory Mutual
FM 6320	Factory Mutual Gas Detection System
NFD	Nairobi Fire Department
NSFM	Nairobi Fire Marshal

- ii. The system shall be certified for seismic applications in accordance with the International Building Code (IBC). For OSHPD applications in California the system shall be Pre-Approved for seismic applications. The basis for qualification of seismic approval shall be via shake table testing.
- iii. The System shall be FM 6320 (Factory Mutual) approved as a Gas Detection system when employed with the FMM-4-20 monitor module and industry standard 4-20 mA gas detectors.

1.2. PRODUCTS

1.2.1. MAIN FIRE ALARM CONTROL PANEL OR NETWORK NODE:

Main FACP or network node shall contain a microprocessor based Central Processing Unit (CPU) and power supply. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices.

In conjunction with intelligent Loop Control Modules and Loop Expander Modules, the main FACP shall perform the following functions:

- i. Supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions.
- ii. Supervise all initiating signaling and notification circuits throughout the facility by way of connection to addressable monitor and control modules.
- iii. Detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed. In the event of CPU failure, all SLC loop modules shall fallback to degrade mode. Such degrade mode shall treat the corresponding SLC loop control modules and associated detection devices as conventional two wire operation. Any activation of a detector in this mode shall automatically activate associated Notification Appliance Circuits.

1.2.2. System Capacity and General Operation

1.2.2.1. The FACP shall be capable of communicating over a Local Area Network (LAN) or Wide Area Network (WAN) utilizing a peer-to-peer, inherently regenerative communication format and protocol. The network shall support communication speed up to 100 Mb and support up to 200 panels / nodes per network.

1.2.2.2. The control panel shall be capable of expansion via up to 10 SLC loops. Each module shall support up to 318 analog/addressable devices for a maximum system capacity of 3180 points. The Fire Alarm Control Panel shall include a full featured operator interface control and annunciation panel that shall include a backlit 640-character liquid crystal display, individual, color coded

system status LEDs, and a keypad for the control of the fire alarm system. Said LCD shall also support graphic bit maps capable of displaying the company name and logo of either thpany.

1.2.2.3. All programming or editing of the existing program in the system shall be achieved without interrupting the alarm monitoring functions of the fire alarm control panel.

The FACP shall be able to provide the following software and hardware features:

- i. Pre-signal and Positive Alarm Sequence: The system shall provide means to cause alarm signals to only sound in specific areas with a delay of the alarm from 60 to up to 180 seconds after start of alarm processing. In addition, a Positive Alarm Sequence selection shall be available that allows a 15second time period for acknowledging an alarm signal from a fire detection/initiating device. If the alarm is not acknowledged within 15 seconds, all local and remote outputs shall automatically activate immediately.
- ii. Smoke Detector Pre-alarm Indication at Control Panel: To obtain early warning of incipient or potential fire conditions, the system shall support a programmable option to determine system response to real-time detector sensing values above the programmed setting. Two levels of Pre-alarm indication shall be available at the control panel: alert and action.
- iii. Alert: It shall be possible to set individual smoke detectors for pre-programmed pre-alarm thresholds. If the individual threshold is reached, the pre-alarm condition shall be activated.
- iv. Action: If programmed for Action and the detector reaches a level exceeding the pre-programmed level, the control panel shall indicate an action condition. Sounder bases installed with either heat or smoke detectors shall automatically activate on action Pre-Alarm level, with general evacuation on Alarm level.
- v. The system shall support a detector response time to meet world annunciation requirements of less than 3 seconds.
- vi. Device Blink Control: Means shall be provided to turn off detector/module LED strobes for special areas.
- vii. NFPA 72 Smoke Detector Sensitivity Test: The system shall provide an automatic smoke detector test function that meets the sensitivity testing requirements of NFPA 72.
- viii. Programmable Trouble Reminder: The system shall provide means to automatically initiate a reminder that troubles exist in the system. The

- reminder will appear on the system display and (if enabled) will sound a piezo alarm.
- ix. On-line or Off-line programming: The system shall provide means to allow panel programming either through an off-line software utility program away from the panel or while connected and on-line. The system shall also support upload and download of programmed database and panel executive system program to a Personal Computer/laptop. A single change to one CPU database shall not require a database download to other CPUs.
 - x. History Events: The panel shall maintain a history file of the last 4000 events, each with a time and date stamp. History events shall include all alarms, troubles, operator actions, and programming entries. The control panels shall also maintain a 1000 event Alarm History buffer, which consists of the 1000 most recent alarm events from the 4000 event history file.
 - xi. Smoke Control Modes: The system shall provide means to perform FSCS mode Smoke Control to meet NFPA-92A and 90B and HVAC mode to meet NFPA 90A.
 - xii. The system shall provide means for all SLC devices on any SLC loop to be auto programmed into the system by specific address. The system shall recognize specific device type ID's and associate that ID with the corresponding address of the device.
 - xiii. Passwords and Users: The system shall support two password levels, master and user. Up to 9 user passwords shall be available, each of which may be assigned access to the programming change menus, the alter status menus, or both. Only the master password shall allow access to password change screens.
 - xiv. Block Acknowledge: The system shall support a block Acknowledge for Trouble Conditions
 - xv. Sensitivity Adjust: The system shall provide Automatic Detector Sensitivity Adjust based on Occupancy schedules including a Holiday list of up to 15 days.
 - xvi. Environmental Drift Control: The system shall provide means for setting Environmental Drift Compensation by device. When a detector accumulates dust in the chamber and reaches an unacceptable level but yet still below the allowed limit, the control panel shall indicate a maintenance alert warning. When the detector accumulates dust in the chamber above the allowed limit, the control panel shall indicate a maintenance urgent warning.
 - xvii. Custom Action Messages: The system shall provide means to enter up to 100 custom action messages of up to 160 characters each. It shall be possible to assign any of the 100 messages to any point.

- xviii. Local Mode: If communication is lost to the central processor the system shall provide added survivability through the intelligent loop control modules. Inputs from devices connected to the SLC and loop control modules shall activate outputs on the same loop when the inputs and outputs have been set with point programming to participate in local mode or when the type codes are of the same type: that is, an input with a fire alarm type code shall activate an output with a fire alarm type code.
- xix. Read status preview - enabled and disabled points: Prior to re-enabling points, the system shall inform the user that a disabled device is in the alarm state. This shall provide notice that the device must be reset before the device is enabled thereby avoiding activation of the notification circuits.
- xx. Custom Graphics: When fitted with an LCD display, the panel shall permit uploading of a custom bit-mapped graphic to the display screen.
- xxi. Multi-Detector and Cooperating Detectors: The system shall provide means to link one detector with up to two detectors at other addresses on the same loop in cooperative multi-detector sensing. There shall be no requirement for sequential addresses on the detectors and the alarm event shall be a result of all cooperating detectors chamber readings.
- xxii. ACTIVE EVENT: The system shall provide a Type ID called FIRE CONTROL for purposes of air-handling shutdown, which shall be intended to override normal operating automatic functions. Activation of a FIRE CONTROL point shall cause the control panel to (1) initiate the monitor module Control-by-Event, (2) send a message to the panel display, history buffer, installed printer and annunciators, (3) shall not light an indicator at the control panel, (4) Shall display ACTIVE on the LCD as well a display a FIRE CONTROL Type Code and other information specific to the device.
- xxiii. NON-FIRE Alarm Module Reporting: A point with a type ID of NON-FIRE shall be available for use for energy management or other non-fire situations. NON-FIRE point operation shall not affect control panel operation nor shall it display a message at the panel LDC. Activation of a NON-FIRE point shall activate control by event logic but shall not cause any indication on the control panel.
- xxiv. Mass Notification Override: The system shall be UL 2572 listed for Mass Notification and shall be capable, based on the Risk Analysis, of being programmed so that Mass Notification/Emergency Communications events take precedence over fire alarm events.
- xxv. Security Monitor Points: The system shall provide means to monitor any point as a type security.
- xxvi. One-Man Walk Test: The system shall provide both a basic and advanced walk test for testing the entire fire alarm system. The basic walk test shall allow a single operator to run audible tests on the panel. All logic equation

automation shall be suspended during the test and while annunciators can be enabled for the test, all shall default to the disabled state. During an advanced walk test, field-supplied output point programming will react to input stimuli such as CBE and logic equations. When points are activated in advanced test mode, each initiating event shall latch the input. The advanced test shall be audible and shall be used for pull station verification, magnet activated tests on input devices, input and output device and wiring operation/verification.

- xxvii. Control By Event Functions: CBE software functions shall provide means to program a variety of output responses based on various initiating events. The control panel shall operate CBE through lists of zones. A zone shall become listed when it is added to a point's zone map through point programming. Each input point such as detector, monitor module or panel circuit module shall support listing of up to 10 zones into its programmed zone map.
- xxviii. Permitted zone types shall be general zone, releasing zone and special zone. Each output point (control module, panel circuit module) can support a list of up to 10 zones including general zone, logic zone, releasing zone and trouble zone. It shall be possible for output points to be assigned to list general alarm. Non-Alarm or Supervisory points shall not activate the general alarm zone.
- xxix. 1000 General Zones: The system shall support up to 1000 general purpose software zones for linking inputs to outputs. When an input device activates, any general zone programmed into that device's zone map will be active and any output device that has an active general zone in its map will be active. It shall also be possible to use general zone as arguments in logic equations.
- xxx. 1000 Logic Equations: The system shall support up to 1000 logic equations for AND, OR, NOT, ONLY1, ANYX, XZONE or RANGE operators that allow conditional I/O linking. When any logic equation becomes true, all output points mapped to the logic zone shall activate.
- xxxi. 100 trouble equations per device: The system shall provide support for up to 100 trouble equations for each device, which shall permit programming parameters to be altered, based on specific fault conditions. If the trouble equation becomes true, all output points mapped to the trouble zone shall activate.
- xxxii. Control-By-Time: A time based logic function shall be available to delay an action for a specific period of time based upon a logic input with tracking feature. A latched version shall also be available. Another version of this shall permit activation on specific days of the week or year with

ability to set and restore based on a 24 hour time schedule on any day of the week or year.

- xxxiii. Multiple agent releasing zones: The system shall support up to 10 releasing zones to protect against 10 independent hazards. Releasing zones shall provide up to three cross-zone and four abort options to satisfy any local jurisdiction requirements.
- xxxiv. Alarm Verification, by device, with timer and tally: The system shall provide a user-defined global software timer function that can be set for a specific detector. The timer function shall delay an alarm signal for a userspecified time period and the control panel shall ignore the alarm verification timer if another alarm is detected during the verification period. It shall also be possible to set a maximum verification count between 0 and 20 with the "0" setting producing no alarm verification. When the counter exceeds the threshold value entered, a trouble shall be generated to the panel.

1.2.2.4. Network Communication

- i. The FACP shall be capable of communicating over a Local Area Network (LAN) or Wide Area Network (WAN) utilizing a peer-to-peer, inherently regenerative communication format and protocol. The network shall support communication speed up to 100 Mb and support up to 200 panels/nodes per network.

1.2.2.5. Central Processing Unit

- i. The Central Processing Unit shall contain and execute all control-by-event (including Boolean functions including but not limited to AND, OR, NOT, ANYx, and CROSSZONE) programs for specific action to be taken if an alarm condition is detected by the system. Such control-by-event programs shall be held in non-volatile programmable memory, and shall not be lost with system primary and secondary power failure
- ii. The Central Processing Unit shall also provide a real-time clock for time annotation, to the second, of all system events. The time-of-day and date shall not be lost if system primary and secondary power supplies fail
- iii. The CPU shall provide an EIA-232 interface between the fire alarm control panel and the UL Listed Electronic Data Processing (EDP) peripherals
- iv. The CPU shall provide two EIA-485 ports for the serial connection to annunciation and control subsystem components.
- v. The EIA-232 serial output circuit shall be optically isolated to assure protection from earth ground

1.2.2.6. Display

- i. The system display shall provide a 640-character backlit alphanumeric Liquid Crystal Display (LCD). It shall also provide eleven Light-Emitting-Diodes (LEDs) that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM, SECURITY, SUPERVISORY, SYSTEM TROUBLE, OTHER EVENT, SIGNALS SILENCED, POINT DISABLED, CONTROLS ACTIVE, and CPU FAILURE.
- ii. The system display shall provide a keypad with control capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels with up to ten (one Master and nine User) passwords shall be accessible through the display interface assembly to prevent unauthorized system control or programming.

1.2.2.7. Loop (Signaling Line Circuit) Control Module:

- i. The Loop Control Module shall monitor and control a minimum of 318 intelligent addressable devices. This includes 159 intelligent detectors (Ionization, Photoelectric, or Thermal) and 159 monitor or control modules.
- ii. The Loop Control Module shall contain its own microprocessor and shall be capable of operating in a local/degrade mode (any addressable device input shall be capable of activating any or all addressable device outputs) in the unlikely event of a failure in the main CPU.
- iii. Each Loop shall be capable of operating as a NFPA Style 4 (Class B) circuit.
- iv. The SLC interface board shall receive analog or digital information from all intelligent detectors and shall process this information to determine whether normal, alarm, or trouble conditions exist for that particular device. Each SLC Loop shall be isolated and equipped to annunciate an Earth Fault condition. The SLC interface board software shall include software to automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information may also be used for automatic detector testing and the automatic determination of detector maintenance requirements.

1.2.2.8. Digital Voice Command Center

- i. The Digital Voice Command Center located with the FACP, shall contain all equipment required for all audio control, emergency telephone system

- control, signaling and supervisory functions. This shall include speaker zone indication and control, telephone circuit indication and control, digital voice units, microphone and main telephone handset.
- ii. Function: The Voice Command Center equipment shall perform the following functions:
- a. Operate as a supervised multi-channel emergency voice communication system.
Operate as a two-way emergency telephone system control center.
 - b. Audibly and visually annunciate the active or trouble condition of every speaker circuit and emergency telephone circuit.
 - c. Audibly and visually annunciate any trouble condition for digital tone and voice units required for normal operation of the system.
 - d. Provide all-call Emergency Paging activities through activation of a single control switch.
 - e. As required, provide vectored paging control to specific audio zones via dedicated control switches.
 - f. Provide a factory recorded "library" of voice messages and tones in standard WAV. File format, which may be edited and saved on a PC running a current Windows® operating system.
 - g. Provide a software utility capable of off-line programming for the DVC operation and the audio message files. This utility shall support the creation of new programs as well as editing and saving existing program files. Uploading or downloading the DVC shall not inhibit the emergency operation of other nodes on the fire alarm network.
 - h. Support an optional mode of operation with four analog audio outputs capable of being used with UL 864 fire-listed analog audio amplifiers and SLC controlled switching.
 - i. The Digital Voice Command shall be modular in construction, and shall be capable of being field programmable without requiring the return of any components to the manufacturer and without requiring use of any external computers or other programming equipment.
 - j. The Digital Voice Command and associated equipment shall be protected against unusually high voltage surges or line transients.

1.2.2.9. Power Supply:

- i. The Main Power Supply shall operate on 120/240 VAC, 50/60 Hz, and shall provide all necessary power for the FACP.
- ii. The Main Power Supply shall provide the required power to the CPU using a switching 24 VDC regulator and shall incorporate a battery charger for 24

- hours of standby power using dual-rate charging techniques for fast battery recharge.
- iii. The Main Power Supply shall provide a battery charger for 24 hours of standby using dual-rate charging techniques for fast battery recharge. The supply shall be capable of charging batteries ranging in capacity from 7-200 amp-hours within a 48-hour period.
 - iv. The Main Power Supply shall provide a very low frequency sweep earth detect circuit, capable of detecting earth faults.
 - v. The Main Power Supply shall be power-limited per UL864 requirements.
 - vi. The Main Power Supply shall communicate power supply, line voltage, battery status and charger status to the local LCD display. Any abnormal condition shall be annunciated and logged to the system alarm history log.
 - vii. Addressable Charger Power SupplyThe auxiliary addressable power supply is a remote 24 VDC power supply used to power Notification Devices and field devices that require regulated 24 VDC power.
 - viii. The addressable power supply for the fire detection system shall provide up to a minimum of 6.0 amps of 24 volt DC regulated power for Notification Appliance Circuit (NAC) power or 10.0 amps of 24 volt DC general power. The power supply shall have an additional 0.5 amp of 24 VDC auxiliary power for use within the same cabinet as the power supply. It shall include an integral charger designed to charge 12 - 200 amp hour batteries.
 - ix. The addressable power supply shall provide four individually addressable Notification Appliance Circuits that may be configured as Class "A" or Class "B" circuits. All circuits shall be power-limited per UL 864 requirements.
 - x. The addressable power supply shall provide built-in synchronization for certain Notification Appliances on each circuit without the need for additional synchronization modules. The power supply's output circuits shall be individually selected for synchronization. A single addressable power supply shall be capable of supporting both synchronized and non-synchronized Notification Devices at the same time.
 - xi. The addressable power supply shall operate on 120 or 240 VAC, 50/60 Hz.
 - xii. The interface to the power supply from the Fire Alarm Control Panel (FACP) shall be via the Signaling Line Circuit (SLC) or other multiplexed means Power supplies that do not use an intelligent interface are not suitable substitutes. The required wiring from the FACP to the addressable power supply shall be a single unshielded twisted pair wire.
 - xiii. The addressable power supply shall supervise for battery charging failure, AC power loss, power brownout, battery failure, NAC loss, and optional ground fault detection. In the event of a trouble condition, the addressable power supply shall report the incident and the applicable address to the FACP via the SLC.

- xiv. The addressable power supply shall have an AC Power Loss Delay option. If this option is utilized and the addressable power supply experiences an AC power loss, reporting of the incident to the FACP will be delayed. A delay time of zero, two, eight or sixteen hours shall be programmable.
- xv. The addressable power supply shall have an option for Canadian Trouble Reporting and this option shall be programmable.
- xvi. The addressable power supply mounts in either the FACP backbox or its own dedicated surface mounted backbox with cover.
- xvii. Each of the power supply's four output circuits shall be programmed- for Notification Appliance Circuit or General Purpose 24 VDC power. Any output circuit shall be able to provide up to 2.5 amps of 24 VDC power.
- xviii. The addressable power supply's output circuits shall be individually supervised when they are selected to be either a Notification Appliance Circuit when wired Class "A" or by the use of an end-of-line resistor. When the power supply's output circuit is selected as General 24 VDC power, the circuit shall be individually supervised when an end-of-line relay is used.
- xix. When selected for Notification Appliance Circuits, the output circuits shall be individually programmable for Steady, March Time, Dual Stage or Temporal.
- xx. When selected as a Notification Appliance Circuit, the output circuits of the addressable power supply shall have the option to be coded by the use of a universal zone coder.
- xxi. The addressable power supply shall interface and synchronize with other power supplies of the same type. The required wiring to interface multiple addressable power supplies shall be a single unshielded, twisted pair wire.
- xxii. An individual or multiple interfaced addressable power supplies shall have the option to use an external charger for battery charging. Interfaced power supplies shall have the option to share backup battery power.

1.2.2.10. Audio Amplifiers

- i. The Audio Amplifiers will provide Audio Power () for distribution to speaker circuits.
- ii. Multiple audio amplifiers may be mounted in a single enclosure, either to supply incremental audio power, or to function as an automatically switched backup amplifier(s).
- iii. The audio amplifier shall include an integral power supply, and shall provide built-in LED indicators for the following conditions:
 - a. Earth Fault on DAP A (Digital Audio Port A)
 - b. Earth Fault on DAP B (Digital Audio Port B)
 - c. Audio Amplifier Failure Detected Trouble

- d. Active Alarm Bus input
 - e. Audio Detected on Aux Input A
 - f. Audio Detected on Aux Input B
 - g. Audio Detected on Firefighter's Telephone Riser
 - h. Receiving Audio from digital audio riser
 - i. Short circuit on speaker circuit 1
 - j. Short circuit on speaker circuit 2
 - k. Short circuit on speaker circuit 3
 - l. Short circuit on speaker circuit 4
 - m. Data Transmitted on DAP A
 - n. Data Received on DAP A
 - o. Data Transmitted on DAP B
 - p. Data Received on DAP B
 - q. Board failure
 - r. Active fiber optic media connection on port A (fiber optic media applications)
 - s. Active fiber optic media connection on port B (fiber optic media applications)
 - t. Power supply Earth Fault
 - u. Power supply 5V present
 - v. Power supply conditions - Brownout, High Battery, Low Battery, Charger Trouble
- iv. The audio amplifier shall provide the following built-in controls:
- a. Amplifier Address Selection Switches
 - b. Signal Silence of communication loss annunciation Reset
 - c. Level adjustment for background music
 - d. Enable/Disable for Earth Fault detection on DAP A
 - e. Enable/Disable for Earth Fault detection on DAP A
 - f. Switch for 2-wire/4-wire FFT riser
- v. Adjustment of the correct audio level for the amplifier shall not require any special tools or test equipment
- vi. Includes audio input and amplified output supervision, back up input, and automatic switch over function, (if primary amplifier should fail).
- vii. System shall be capable of backing up digital amplifiers.

- viii. One-to-one backup shall be provided by either a plug-in amplifier card or a designated backup amplifier of identical model as the primary amplifier.
- ix. One designated backup amplifier shall be capable of backing up multiple primary amplifiers mounted in the same or adjacent cabinets.
- x. Multi-channel operation from a single amplifier shall be supported by the addition of an optional plug-in amplifier card.

1.2.2.11. Audio Message Generator (Prerecorded Voice)/Speaker Control:

- i. Each initiating zone or intelligent device shall interface with an emergency voice communication system capable of transmitting a prerecorded voice message to all speakers in the building.
- ii. Actuation of any alarm initiating device shall cause a prerecorded message to sound over the speakers. The message shall be repeated four (4) times.
Pre- and post-message tones shall be supported.
- iii. A built-in microphone shall be provided to allow paging through speaker circuits.
- iv. System paging from emergency telephone circuits shall be supported.
- v. The audio message generator shall have the following indicators and controls to allow for proper operator understanding and control:
 - i. Lamp Test
 - ii. Trouble
 - iii. Off-Line Trouble
 - iv. Microphone Trouble
 - v. Phone Trouble
 - vi. Busy/Wait
 - vii. Page Inhibited
 - viii. Pre/Post Announcement Tone

1.2.2.12. Controls with associated LED Indicators:

- i. Speaker Switches/Indicators
 - a. The speaker circuit control switches/indicators shall include visual indication of active and trouble status for each speaker circuit in the system.

- b. The speaker circuit control panel shall include switches to manually activate or deactivate each speaker circuit in the system.\
- ii. Emergency Two-Way Telephone Control Switches/Indicators
 - a. The emergency telephone circuit control panel shall include visual indication of active and trouble status for each telephone circuit in the system.
 - b. The telephone circuit control panel shall include switches to manually activate or deactivate each telephone circuit in the system.

1.2.2.13. Remote Transmissions:

- i. Provide local energy or polarity reversal or trip circuits as required.
- ii. The system shall be capable of operating a polarity reversal or local energy or fire alarm transmitter for automatically transmitting fire information to the fire department.
- iii. Provide capability and equipment for transmission of zone alarm and trouble signals to remote operator's terminals, system printers and annunciators.
- iv. Transmitters shall be compatible with the systems and equipment they are connected to such as timing, operation and other required features.

1.2.2.14. Field Programming

- i. The system shall be programmable, configurable and expandable in the field without the need for special tools, laptop computers, or other electronic interface equipment. There shall be no firmware changes required to field modify the system time, point information, equations, or annunciator programming/information.
- ii. All field defined programs shall be stored in non-volatile memory.

1.2.2.15. Specific System Operations

- i. Smoke Detector Sensitivity Adjust: A means shall be provided for adjusting the sensitivity of any or all addressable intelligent detectors in the system from the system keypad. Sensitivity range shall be within the allowed UL window and have a minimum of 9 levels.
- ii. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently selected and enabled to be an alarm verified detector. The alarm verification delay shall be programmable from 0 to 60

seconds and each detector shall be able to be selected for verification. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.

1.2.2.16. System Point Operations:

- i. Any addressable device in the system shall have the capability to be enabled or disabled through the system keypad or video terminal.
- ii. System output points shall be capable of being turned on or off from the system keypad or the video terminal.
- iii. Point Read: The system shall be able to display the following point status diagnostic functions without the need for peripheral equipment. Each point shall be annunciated for the parameters listed:
 - a. Device Status.
 - b. Device Type.
 - c. Custom Device Label.
 - d. Software Zone Label.
 - e. Device Zone Assignments.
 - f. Analog Detector Sensitivity.
 - g. All Program Parameters.
- iv. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 4000 system events. Each of these events will be stored, with time and date stamp, until an operator requests that the contents be either displayed or printed. The contents of the history buffer may be manually reviewed; one event at a time, and the actual number of activations may also be displayed and or printed. History events shall include all alarms, troubles, operator actions, and programming entries.
- v. The history buffer shall use non-volatile memory. Systems which use volatile memory for history storage are not acceptable.
- vi. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent system detector and shall analyze the detector responses over a period of time.
- vii. If any intelligent detector in the system responds with a reading that is below or above normal limits, then the system will enter the trouble mode, and the particular Intelligent Detector will be annunciated on the system display, and printed on the optional system printer. This feature shall in no way inhibit the

- receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
- viii. The system shall include the ability (programmable) to indicate a "prealarm" condition. This will be used to alert maintenance personal when a detector is at 80% of its alarm threshold in a 60 second period.

1.2.3. SYSTEM COMPONENTS:

1.2.3.1. Conventional Aspirating Detection

- i. An optional air aspiration detection system shall be available.
- ii. The aspirating system shall support multiple sensitivity settings.
- iii. The aspirating system shall operate from 24 VDC.
- iv. The aspirating system shall provide alarm and trouble relays used to activate a fire alarm control panel.

1.2.3.2. Aspiration System Interface:

- i. The system shall be capable of supporting Interface Modules for integrating Vesda Aspiration detectors into SLC loop of the fire alarm control panel. The Interface Module shall support up to 19 detectors detectors, each SLC loop shall support one interface module.

1.2.3.3. High Level Aspiration System Interface:

- i. The system shall be capable of supporting a High Level Interface for Vesda Aspirating Detection Systems. The interface shall support up to 100 detectors and allow the fire alarm network to monitor and control events on the aspiration system.
- ii. Portable Emergency Telephone Handset Jack
- iii. Portable emergency telephone handset jacks shall be flush mounted on stainless steel plates as indicated on plans. Handset jacks shall be approved for emergency telephone system application.
- iv. Insertion of a remote handset plug into a jack shall send a signal to the fire command center which shall audibly and visually indicate the on-line condition, and shall sound a ring indication in the handset.
- v. The two-way emergency telephone system shall support a minimum of seven (7) handsets on line without degradation of the signal.

1.2.3.4. Fixed Emergency Telephone Handset

- i. The telephone cabinet shall be painted red and clearly labeled emergency telephone. The cabinets shall be located where shown on drawings.
- ii. The handset cradle shall have a switch connection such that lifting the handset off of the cradle shall send a signal to the fire command center which shall audibly and visually indicate its on-line (off-hook) condition.
- iii. The two-way emergency telephone system shall support a maximum of seven (7) handsets on line (off hook) without degradation of the signal.

1.2.3.5. Universal Digital Alarm Communicator Transmitter (UDACT). The UDACT is an interface for communicating digital information between a fire alarm control panel and an UL-Listed central station.

- i. The UDACT shall be compact in size, mounting in a standard module position of the fire alarm control cabinet. Optionally, the UDACT shall have the ability for remote mounting, up to 6,000 feet from the fire alarm control panel. The wire connections between the UDACT and the control panel shall be supervised with one pair for power and one pair for multiplexed communication of overall system status. Systems that utilize relay contact closures are not acceptable.
- ii. The UDACT shall include connections for dual telephone lines (with voltage detect), per UL/NFPA/FCC requirements. It shall include the ability for split reporting of panel events up to two different telephone numbers.
- iii. The UDACT shall be capable of transmitting events in 4+2, SIA, and Contact ID.
- iv. Communication shall include vital system status such as:
 - a. Independent Zone (Alarm, trouble, non-alarm, supervisory)
 - b. Independent Addressable Device Status
 - c. AC (Mains) Power Loss
 - d. Low Battery and Earth Fault
 - e. System Off Normal
 - f. 12 and 24 Hour Test Signal
 - g. Abnormal Test Signal (per UL requirements)
 - h. EIA-485 Communications Failure
 - i. Phone Line Failure

- v. The UDACT shall support independent zone/point reporting when used in the Contact ID format. In this format the UDACT shall support transmission of up to 3,064 points. This enables the central station to have exact details concerning the origin of the fire or response emergency.
- vi. The UDACT shall be capable of being programmed with the same programming utility as the host FACP, and saved, edited and uploaded and downloaded using the utility. UDACT shall be capable of being programmed online or offline. The programming utility shall also support upgrading UDACT operating firmware.
- vii. The UDACT shall be capable of generating Central Station reports providing detailed programming information for each point along with the central station point address.
- viii. An IP or IP/GSM Communicator option shall be available to interface to the UDACT and be capable of transmitting signals over the internet/intranet or Cellular (GSM) network to a compatible receiver.

1.2.3.6. Field Wiring Terminal Blocks

- i. For ease of service all panel I/O wiring terminal blocks shall be removable, plug-in types and have sufficient capacity for #18 to #12 AWG wire. Terminal blocks that are permanently fixed are not acceptable.

1.2.3.7. Printer

- i. The printer shall provide hard-copy printout of all changes in status of the system and shall time-stamp such printouts with the current time-of-day and date. The printer shall be standard carriage with 80-characters per line and shall use standard pin-feed paper. The printer shall be enclosed in a separate cabinet suitable for placement on a desktop or table. The printer shall communicate with the control panel using an interface complying with Electrical Industries Association standard EIA-232D. Power to the printer shall be 120 VAC @ 60 Hz.
- ii. The system shall have a strip printer capable of being mounted directly in the main FACP enclosure. Alarms shall be printed in easy-to-read RED, other messages, such as a trouble, shall be printed in BLACK. This printer shall receive power from the system power supply and shall operate via battery back-up if AC mains are lost. The strip printer shall be UL 864 listed.
- iii. The system shall have a strip printer capable of being mounted directly in the main FACP enclosure. Alarms shall be printed in easy-to-read RED, other messages, such as a trouble, shall be printed in BLACK. This printer

shall receive power from the system power supply and shall operate via battery back-up if AC mains are lost. The strip printer shall be UL 864 listed.

1.2.3.8. Smoke Control Annunciator

- i. On/Auto/Off switches and status indicators (LEDS) shall be provided for monitoring and manual control of each fan, damper, HVAC control unit, stairwell pressurization fan, and smoke exhaust fan. To ensure compliance the units supplied shall meet the following UL categories: UUKL, PAZX, UDTZ, QVAX as well as the requirements of NFPA 90A, HVAC, and NFPA 92A & 92B, Smoke Control. The control System shall be field programmable for either 90A operation or 92A/B operation to allow for future use and system expansion.
- ii. The OFF LED shall be Yellow, the ON LED shall be green, the Trouble/Fault LED shall be Amber/Orange for each switch. The Trouble/Fault indicator shall indicate a trouble in the control and/or monitor points associated with that switch. In addition, each group of eight switches shall have two LEDS and one momentary switch which allow the following functions: An Amber LED to indicate an OFF-NORMAL switch position, in the ON or OFF position; A Green LED to indicate ALL AUTO switch position; A Local Acknowledge/Lamp Test momentary switch.
- iii. Each switch shall have the capability to monitor and control two addressable inputs and two addressable outputs. In all modes, the ON and OFF indicators shall continuously follow the device status not the switch position. Positive feedback shall be employed to verify correct operation of the device being controlled. Systems that indicate on/off/auto by physical switch position only are not acceptable.
- iv. All HVAC switches (i.e., limit switches, vane switches, etc.) shall be provided and installed by the HVAC contractor.
- v. It shall be possible to meet the requirements mentioned above utilizing wall mounted custom graphic.

1.2.3.9. Gateway & Webserver Options

1.2.3.9.1. Common Alerting Protocol (CAP) Gateway:

The system shall support an optional CAP Gateway (Common Alerting Protocol). The CAP Gateway translates fire system messages to industry standard CAP messages for integration with CAP-compliant clients. A CAP gateway shall be available from the fire alarm control panel manufacturer.

1.2.3.9.2. LEDSIGN Gateway:

The system shall support an optional and proprietary LEDSIGN Gateway to interface to LED signs that will automatically display emergency messages. The signs shall be capable of storing up to 100 messages that can be activated via system programming with the ability to be manually overridden. The Sign Gateway shall support up to 10 independent signs, each sign capable of playing an independent message. Multiple LEDSIGN Gateways can be used in network applications. An LEDSIGN gateway shall be available from the fire alarm control panel manufacturer.

1.2.3.9.3. BACnet Interface Gateway:

The system shall be capable of being interfaced with BACNet compliant clients. A BACnet interface supporting BACnet/IP communication shall be available from the fire alarm control panel manufacturer.

1.2.3.9.4. MODbus Interface Gateway:

The system shall be capable of being interfaced with MODbus compliant clients. A MODbus interface supporting MODbus/TCP communication shall be available from the fire alarm control panel manufacturer.

1.2.3.9.5. Net Gateway:

The system shall support an IP based gateway to enable the panel or local Net to be connected to a Graphics software workstation via the Internet or Intranet. This gateway shall also support the ability to integrate the system to an interactive firefighter's display. The Net Gateway shall be available from the fire alarm control manufacturer.

1.2.3.9.6. Webserver:

The system shall support a webserver allowing remote connection via the Internet or Intranet. Authorized users will have the ability to view panel/network history, event status and device properties. The webserver shall also support sending event information via email or text to up to 50 registered users, the webserver shall be available from the fire alarm control panel manufacturer.

1.2.3.9.7. Web Portal Interface:

The system shall be capable of being interfaced with a web portal to integrate with Inspection and Service Manager Utilities. The web portal and inspection and service manager utilities shall be available from the fire alarm control panel manufacturer.

1.2.4. SYSTEM COMPONENTS - ADDRESSABLE DEVICES

1.2.4.1. Addressable Devices - General

- i. Addressable devices shall provide an address-setting means using rotary decimal switches. Addressable devices that require the address be programmed using a programming utility are not an allowable substitute.
- ii. Addressable devices shall use simple to install and maintain decade, decimal address switches. Devices shall be capable of being set to an address in a range of 001 to 159.
- iii. Addressable devices, which use a binary-coded address setting method, such as a DIP-switch, are not an allowable substitute. Addressable devices that require the address be programmed using a special tool or programming utility are not an allowable substitute.
- iv. Addressable devices, which use a binary-coded address setting method, such as a DIP-switch, are not an allowable substitute. Addressable devices that require the address be programmed using a special tool or programming utility are not an allowable substitute.
- v. Detectors shall be intelligent (analog) and addressable, and shall connect with two wires to the fire alarm control panel Signaling Line Circuits.
- vi. Addressable smoke and thermal detectors shall provide dual alarm and power/polling LEDs. Both LEDs shall flash green under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady red illumination by the control panel, indicating that an alarm condition has been detected. If required, the LED flash shall have the ability to be removed from the system program. An output connection shall also be provided in the base to connect an external remote alarm LED.
- vii. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system. The panel on a time-of-day basis shall automatically adjust sensitivity.
- viii. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72.

- ix. The detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Base options shall include a sounder base with a built-in (local) sounder rated at 85 DBA minimum, a relay base and an isolator base designed for Style 7 applications. The system shall also support an intelligent programmable sounder base, the programmable sounder base shall be capable of providing multiple tones based on programming and at a minimum be capable of providing a Temp-4 tone for CO (Carbon Monoxide) activation and a Temp-3 tone for fire activations and be capable of being synchronized with other programmable sounder bases and common area notification appliances; 85 DBA minimum.
- x. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).
- xi. Detectors will operate in an analog fashion, where the detector simply measures its designed environment variable and transmits an analog value to the FACP based on real-time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analog value of each detector.
- xii. Addressable devices shall store an internal identifying code that the control panel shall use to identify the type of device.
- xiii. A magnetic test switch shall be provided to test detectors and modules. Detectors shall report an indication of an analog value reaching 100% of the alarm threshold.
- xiv. Addressable modules shall mount in a 4-inch square (101.6 mm square), 21/8 inch (54 mm) deep electrical box. An optional surface mount Lexan enclosure shall be available.

1.2.4.2. Addressable Manual Fire Alarm Box (manual station)

- i. Addressable manual fire alarm boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status; They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.
- ii. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
- iii. Manual fire alarm boxes shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches (44 mm) or larger.

1.2.4.3. Intelligent Photoelectric Smoke Detector:

The intelligent photoelectric smoke detector shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

1.2.4.4. Intelligent VIEW® Laser Photo Smoke Detector:

- i. The intelligent laser photo smoke detector shall be a spot type detector that incorporates an extremely bright laser diode and an integral lens that focuses the light beam to a very small volume near a receiving photo sensor. The scattering of smoke particles shall activate the photo sensor.
- ii. The laser detector shall have conductive plastic so that dust accumulation is reduced significantly
- iii. The intelligent laser photo detector shall have nine sensitivity levels and be sensitive to a minimum obscuration of 0.02 percent per foot.
- iv. The laser detector shall not require expensive conduit, special fittings or PVC pipe.
- v. The intelligent laser photo detector shall support standard, relay, isolator and sounder detector bases.
- vi. The laser photo detector shall not require other cleaning requirements than those listed in NFPA 72. Replacement, refurbishment or specialized cleaning of the detector head shall not be required.
- vii. The laser photo detector shall include two bicolor LEDs that flash green in normal operation and turn on steady red in alarm.

1.2.4.5. Intelligent Ionization Smoke Detector:

The intelligent ionization smoke detector shall use the dual-chamber ionization principal to measure products of combustion and shall, on command from the control panel, send data to the panel representing the analog level of products of combustion.

1.2.4.6. Intelligent Multi Criteria Acclimating Detector:

- i. The intelligent multi-criteria Acclimate® Plus™ detector shall be an addressable device that is designed to monitor a minimum of photoelectric and thermal technologies in a single sensing device. The design shall include the ability to adapt to its environment by

utilizing a built-in microprocessor to determine its environment and choose the appropriate sensing settings. The detector design shall allow a wide sensitivity window, no less than 1 to 4% per foot obscuration. This detector shall utilize advanced electronics that react to slow smoldering fires and thermal properties all within a single sensing device.

- ii. The intelligent multi criteria detection device shall include the ability to combine the signal of the thermal sensor with the signal of the photoelectric signal in an effort to react hastily in the event of a fire situation. It shall also include the inherent ability to distinguish between a fire condition and a false alarm condition by examining the characteristics of the thermal and smoke sensing chambers and comparing them to a database of actual fire and deceptive phenomena

1.2.4.7. Intelligent Thermal Detectors:

The intelligent thermal detectors shall be addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. A high heat thermal detector rated at 190 degrees Fahrenheit shall also be available. The thermal detectors shall connect via two wires to the fire alarm control panel signaling line circuit.

1.2.4.8. Intelligent Duct Smoke Detector:

The smoke detector housing shall accommodate an intelligent photoelectric detector that provides continuous analog monitoring and alarm verification from the panel. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system. The Intelligent Duct Smoke Detector shall support the installation of addressable Photoelectric detector capable or being tested remotely. The Intelligent Duct Detector housing shall be model # DNR(W) and the remote test capable photoelectric smoke detector.

1.2.4.9. IntelliQuad™ Advanced Multi-Criteria Intelligent Detector

- i. Intelligent multi-criteria fire detector shall be an addressable intelligent multi-criteria smoke detector. The detector shall be comprised of four sensing elements, including a photoelectric (light-scattering) particulate sensor, an electrochemical carbon monoxide (CO) sensor, a daylight-filtered infrared sensor and solid state thermal sensor(s) rated at 135°F (57.2°C). The device shall be able to indicate distinct smoke and heat alarms.
- ii. The intelligent multi-criteria detection device shall include the ability to combine the signal of the photoelectric signal with other sensing elements in an effort to react quickly in the event of a fire situation. It shall also include the inherent ability to distinguish between a fire condition and a nuisance alarm condition. The product design shall be capable of selecting the appropriate sensitivity levels based on the environment type chosen by user in which it is installed (office, manufacturing, kitchen etc.) and then have the ability to automatically change the setting as the environment changes.
- iii. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The device shall provide unique signals to indicate when 20% of the drift range is remaining, when 100% of drift range is used, and when there is a chamber fault to show unit requires maintenance.
- iv. The detector shall indicate CO trouble conditions including 6 months of sensor life remaining and sensor life has expired. The detector shall indicate a combined signal for any of the following: low chamber trouble, thermistor trouble, CO self test failure, IR self test failure, and freeze warning
- v. The detectors shall provide address-setting means on the detector head using rotary switches. Because of the possibility of installation error, systems that use binary jumpers or DIP switches to set the detector address are not acceptable. The detectors shall also store an internal identifying code that the control panel shall use to identify the type of detector. Systems that require a special programmer to set the detector

address (including temporary connection at the panel) are labor intensive and not acceptable. Each detector occupies any one of at least 99 possible addresses on the signaling line circuit (SLC) loop. It responds to regular polls from the system and reports its type and status.

- vi. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a switch) or initiated remotely on command from the control panel. There are three test methods: functional magnet, smoke entry aerosol, or direct heat method.
- vii. The detectors shall provide two LEDs to provide 360° visibility. The LEDs are placed into steady red illumination by the control panel indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED, sounder base, and / or relay base (optional accessories). The external remote alarm can be interconnected to other sounder or relay bases for activating all devices in a space via a single alarming unit.
- viii. Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.
- ix. The detectors shall be ceiling-mount and shall be plug-in mounted into a twist-lock base. These detectors shall be constructed of off-white UV resistant polymer and shall be detachable from the mounting base to simplify installation, service and maintenance. Mounting base wiring connections shall be made by means of SEMS screws. The detector shall allow pre-wiring of the base and the head shall be a plug-in type. Mounting base shall be mounted on junction box which is at least 1.5 inches (3.81 cm) deep. Mounting base shall be available to mount to standard junction boxes. Suitable boxes include:
 - a. 4.0" (10.16 cm) square box with and without plaster ring.
 - b. 4.0" (10.16 cm) octagonal box.

- c. 3.5" (8.89 cm) octagonal box.
 - d. Single-gang box.
- x. Meets Agency Standards
- a. ANSI/UL 268 -Smoke Detectors for Fire Alarm Signaling Systems
 - b. CAN/ULC-S529- Smoke Detectors for Fire Alarm Systems
 - c. FM 3230-3250- Smoke Actuated Detectors for Automatic Fire Alarm Signaling

1.2.4.10. IntelliQuad™ PLUS Advanced Multi-Criteria Intelligent Fire/CO Detector

- i. Advanced Multi-Criteria Fire/CO detector shall be an addressable advanced multi-criteria smoke detector with a separate signal for carbon monoxide (CO) detection per UL 2075 standards.
- ii. The detector shall be comprised of four sensing elements, including a photoelectric (light-scattering) particulate sensor, an electrochemical CO sensor, a daylight-filtered infrared (IR) sensor and solid state thermal sensor(s) rated at 135°F (57.2°C). The device shall be able to indicate distinct smoke and heat alarms.
- iii. The advanced multi-criteria detection device shall include the ability to combine the signal of the photoelectric signal with other sensing elements in order to react quickly in the event of a fire situation. It shall also include the inherent ability to distinguish between a fire condition and a nuisance alarm condition. The detector shall be capable of selecting the appropriate sensitivity levels based on the environment type (office, manufacturing, kitchen, etc.) in which it is installed, and then have the ability to automatically change the setting as the environment changes.
- iv. The CO detector component shall be capable of a functional gas test using a canned test agent to test the functionality of the CO sensing cell.
- v. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The device shall provide unique signals to indicate when 20 percent of the drift range is remaining, when 100 percent of drift range is used, and when there is a chamber fault to show the unit requires maintenance.
- vi. The detector shall indicate CO trouble conditions, including six months of sensor life remaining and sensor life has expired. The detector shall indicate a combined signal for any of the following: low chamber

- trouble, thermistor trouble, CO self test failure, IR self test failure, and freeze warning.
- vii. The detector shall provide address-setting means on the detector head using rotary switches. Because of the possibility of installation error, systems that use binary jumpers or DIP switches to set the detector address are not acceptable. The detector shall also store an internal identifying code that the control panel shall use to identify the type of detector. Systems that require a special programmer to set the detector address (including temporary connection at the panel) are labor intensive and not acceptable. Each detector occupies any one of at least 159 possible addresses on the signaling line circuit (SLC) loop. It responds to regular polls from the system and reports its type and status.
 - viii. The detector shall provide a test means whereby it will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a switch) or initiated remotely on command from the control panel. There shall be four test methods: functional magnet, smoke entry aerosol, carbon monoxide aerosol or direct heat method.
 - ix. The detector shall provide two LEDs to provide 360° visibility. The LEDs shall be placed into steady red illumination by the control panel indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED. The detector must be capable of connecting to a sounder base that provides both temporal 3 and temporal 4 patterns for fire and CO alarm.
 - x. Two LEDs on the sensor shall be controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, shall cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.
 - xi. The detector shall be plug-in mounted into a twist-lock base. The detector shall be constructed of off-white, UV-resistant polymer and shall be detachable from the mounting base to simplify installation, service and maintenance. Mounting base wiring connections shall be made by means of SEMS screws. The detector shall allow pre-wiring of the base and the head shall be a plug-in type. The mounting base shall be mounted on a junction box that is at least 1.5 inches (3.81 cm) deep. The mounting base shall be available to mount to standard junction boxes. Suitable boxes include:
 - a. 4.0" (10.16 cm) square box with and without plaster ring.

- b. 4.0" (10.16 cm) octagonal box.
- c. 3.5" (8.89 cm) octagonal box.
- d. Single-gang box.
- e. Double-gang box

xii. Meets Agency Standards

- a. ANSI/UL 268 -Smoke Detectors for Fire Alarm Signaling Systems
- b. CAN/ULC-S529- Smoke Detectors for Fire Alarm Systems
- c. FM 3230-3250- Smoke Actuated Detectors for Automatic Fire Alarm Signaling
- d. UL 2075 – Gas and Vapor Detector and Sensors – Systems Connected

1.2.4.11. Intelligent Addressable Aspiration Detector:

The intelligent aspiration detector shall be an addressable aspiration detector that communicates directly with the fire alarm control panel via the SLC communication protocol, no modules or high-level interfaces shall be required. The fire alarm control panel shall support up to thirty-one intelligent aspiration detectors per SLC loop. The aspiration detector shall have dual source (blue LED and infrared laser) optical smoke detection for a wide range of fire detection with enhanced immunity to nuisance particulates. The FACP shall be capable of monitoring and annunciating up to five smoke event thresholds and eleven trouble conditions. Each event threshold shall be capable of being assigned a discrete type ID at the FACP.

1.2.4.12. Intelligent Addressable Reflected Beam Detector

The intelligent single-ended reflected beam smoke detector shall connect with two wires to the fire alarm control panel signaling line circuit (SLC). The detectors shall consist of a transmitter/receiver unit and a reflector and shall send data to the panel representing the analog level of smoke density. The detector shall be capable of being tested remotely via a keyswitch and shall be equipped with an integral sensitivity test feature.

1.2.4.13. Addressable Dry Contact Monitor Module

- ii Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLCs.
- iii The IDC zone shall be suitable for Style D/Class A or Style B/Class B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel
- iv For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED
- v For multiple dry contact monitoring a module shall be available that provides 10 Style B or 5 Style D input circuits

1.2.3.14. Two Wire Detector Monitor Module

- iii. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional 2-wire smoke detectors or alarm initiating devices (any N.O. dry contact device);
- iv. The IDC zone may be wired for Class A or B (Style D or Style B) operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel
- v. For multiple 2-wire smoke detector circuit monitoring a module shall be available that provides 6 Style B/Class A or 3 Style D/Class B input circuits

1.2.3.15. Addressable Control Module

- ii. Addressable control modules shall be provided to supervise and control the operation of one conventional circuit of compatible Notification Appliances, 24VDC powered, polarized audio/visual notification appliances;
- iii. The control module NAC may be wired for Style Z or Style Y (Class A/B) with a current rating of 2 Amps for Style Z and 3 Amps for Style Y

- iv. Audio/visual power shall be provided by a separate supervised circuit from the main fire alarm control panel or from a supervised UL listed remote supply
- v. For multiple circuit control a module shall be available that provides 6 Style Y (Class B) or 3 Style Z (Class A) control circuits

1.2.3.16. Addressable Releasing Control Module

- i. An addressable FlashScan releasing module shall be available to supervise and control compatible releasing agent solenoids
- ii. The module shall operate on a redundant protocol for added protection
- iii. The module shall be configurable for Style Z or Style Y (Class A/B) and support one 24 volt or two 12 volt solenoids. Add FMM-4-20.
- iv. Addressable 4-20 mA module shall be available to monitor industry-standard, linear-scale, 4-20 mA protocol sensors. The module converts the sensor output to communication protocol that can be interpreted by the FACP for monitoring and display.
- v. The module shall support programming of up to five programmable event thresholds.
- vi. The System shall be FM 6320 (Factory Mutual) approved as a Gas Detection system when employed with the monitor module and industry standard 420 mA gas detectors.

1.2.3.17. Addressable Relay Module:

- i. Addressable Relay Modules shall be available for HVAC control and other network building functions;
- ii. The module shall provide two form C relays rated at up to 3 Amps resistive and up to 2.0 Amps inductive.
- iii. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary devices energize at the same time on the same pair of wires;
- iv. For multiple relay control a module shall be available that provides 6 programmable Form-C relays;

1.2.3.18. Addressable Two-In / Two-Out Monitor/Relay Module:

- ix. An addressable Two-In / Two-Out module shall be available;

- ii. The two-in/two-out module shall provide two Class B/Style B dry-contact input circuits and two independent Form-C relays rated at up to 3 Amps resistive and up to 2.0 Amps inductive

1.2.3.19. Isolator Module:

- i. Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC Class A or Class B branch. The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC loop segment or branch. At least one isolator module shall be provided for each floor or protected zone of the building;
- ii. If a wire-to-wire short occurs, the isolator module shall automatically open circuit (disconnect) the SLC. When the short circuit condition is corrected, the isolator module shall automatically reconnect the isolated section
- iii. The isolator module shall not require address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator module after its normal operation
- iv. The isolator module shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated

1.2.3.20. Serially Connected Annunciator Requirements

- i. The annunciator shall communicate to the fire alarm control panel via an EIA 485 (multi-drop) two-wire communications loop. The system shall support two 6,000 ft. EIA-485 wire runs. Up to 32 annunciators, each configured up to 96 points, may be connected to the connection, for a system capacity of 3,072 points of annunciation.
- ii. An EIA-485 repeater shall be available to extend the EIA-485 wire distance in 3,000 ft. increments. The repeater shall be UL864 approved
- iii. Each annunciator shall provide up to 96 alarm and 97 trouble indications using a long-life programmable color LED's. Up to 96 control switches shall also be available for the control of Fire Alarm Control Panel functions. The annunciator will also have an "ON-LINE" LED, local piezo sounder, local acknowledge and lamp test switch, and custom zone/function identification labels
- iv. The annunciator may be field configured to operate as a "Fan Control Annunciator". When configured as "Fan Control," the annunciator may be used to manually control fan or damper operation and can be set to override automatic commands to all fans/dampers programmed to the

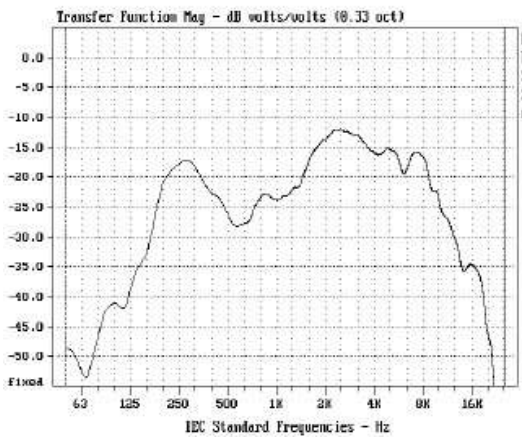
- annunciator. 5. Annunciator switches may be programmed for System control such as, Global Acknowledge, Global Signal Silence, Global System Reset, and on/off control of any control point in the system
- v. An optional module shall be available to utilize annunciator points to drive EIA-485 driven relays. This shall extend the system point capacity by 3,072 remote contacts
 - vi. The LED annunciator shall offer an interface to a graphic style annunciator and provide each of the features listed above

1.2.3.21. SpectrAlert Advance Speakers

- i. The Speaker appliance shall be System Sensor SpectrAlert Advance model _____ Speaker. The speaker shall be listed to UL 1480 for Fire Protective Signaling Systems. It shall be a dual-voltage transformer speaker capable of operation at 25.0 or 70.7 nominal Vrms. The speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature between 32°F and 120°F. It shall mount to a 4 x 4 x 2 1/8-inch back box
- ii. A universal mounting plate shall be used for mounting ceiling and wall speaker products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate
- iii. Speakers shall be plug-in and shall have the ability to check wiring continuity via a shorting spring on the universal mounting plate. The shorting spring shall also provide tamper resistance via an open circuit if the device is removed. Speaker design shall isolate speaker components to reduce ground fault incidents
- iv. The speaker shall have power taps (from 1/4 watt to 2 watts) and voltage that are selected by rotary switches. All models shall have a maximum sound output of 86 dB at 10 feet and shall incorporate an open back construction
- v. All notification appliances shall be backward compatible

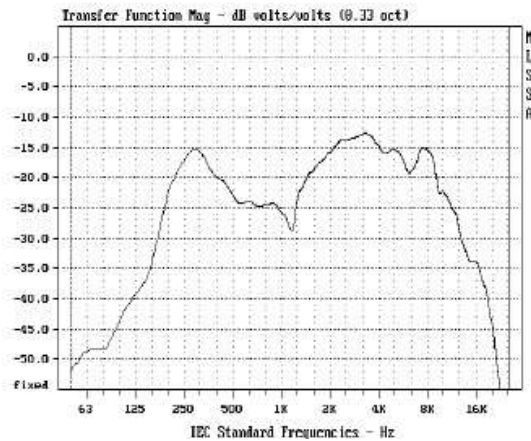
Ceiling Speaker

Wide Band Frequency Response



Wall Speaker

Wide Band Frequency Response



Note: The wide band frequency response is derived using MLS methods

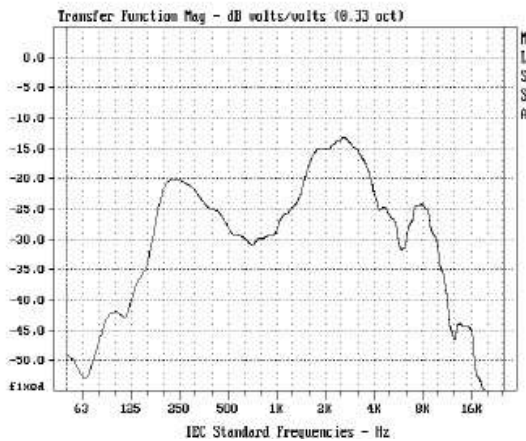
1.2.3.22. SpectrAlert Advance Speaker Strobes

- i. The Speaker Strobe appliance shall be System Sensor SpectrAlert Advance model _____ Speaker Strobe. The speaker strobe shall be listed to UL 1971 and UL 1480 and be approved for fire protective signaling systems. It shall be a dual-voltage transformer speaker strobe capable of operation at 25.0 or 70.7 nominal Vrms. The speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature between 32°F and 120°F. It shall mount to a 4 x 4 x 2 1/8-inch back box.
- ii. A universal mounting plate shall be used for mounting ceiling and wall speaker strobe products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate. Also, SpectrAlert Advance speaker strobes and the Sync•Circuit™ Module MDL3 accessory, if used, shall be powered from a non-coded notification appliance circuit output and shall operate on a nominal 12 or 24 volts (includes fire alarm panels with built in sync). When used with the Sync•Circuit Module MDL3, 12-volt rated notification appliance circuit outputs shall operate between 8.5 and 17.5 volts; 24-volt rated notification appliance circuit outputs shall operate between 16.5 to 33 volts. If the notification appliances are not UL 9th edition listed with the corresponding panel or power supply being used, then refer to the compatibility listing of the panel to determine maximum devices on a circuit

- iii. Speaker strobes shall be plug-in and shall have the ability to check wiring continuity via a shorting spring on the universal mounting plate. The shorting spring shall also provide tamper resistance via an open circuit if the device is removed. Speaker strobe design shall isolate speaker components to reduce ground fault incidents
- iv. The speaker strobe shall have power taps (from 1/4 watt to 2 watts) and voltage that are selected by rotary switches. All models shall have a maximum sound output of 86 dB at 10 feet and shall incorporate an open back construction. The strobe shall consist of a xenon flash tube with associated lens/reflector system and operate on either 12V or 24V. The strobe shall also feature selectable candela output, providing options for 15 or 15/75 candela when operating on 12V and 15, 15/75, 30, 75, 110, or 115 when operating on 24V. The strobe shall comply with NFPA 72 and the Americans with Disabilities Act requirement for visible signaling appliances, flashing at 1 Hz over the strobe’s entire operating voltage range
- v. All notification appliances shall be backward compatible
- vi. Strobe lights shall meet the requirements of the ADA, UL Standard 1971 and be fully synchronized

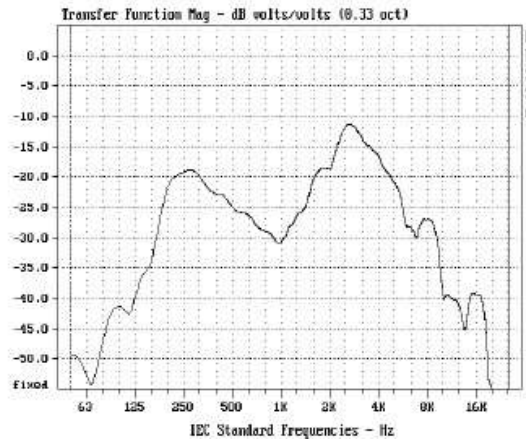
Ceiling Speaker Strobe

Wide Band Frequency Response



Wall Speaker Strobe

Wide Band Frequency Response



Note: The wide band frequency response is derived using MLS methods

1.3. EXECUTION

1.3.1. INSTALLATION:

- i. Installation shall be in accordance with the NEC, NFPA 72 and local codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- ii. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
- iii. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.
- iv. Manual fire alarm boxes shall be suitable for surface mounting or semi-flush mounting as shown on the plans, and shall be installed not less than 42 inches (1067 mm), nor more than 48 inches (122 mm) above the finished floor

1.3.2. TEST:

The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72.

- i. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
- ii. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP
- iii. Verify activation of all waterflow switches
- iv. Open initiating device circuits and verify that the trouble signal actuates
- v. Open and short signaling line circuits and verify that the trouble signal actuates
- vi. Open and short notification appliance circuits and verify that trouble signal actuates
- vii. Ground all circuits and verify response of trouble signals.
- viii. Check presence and audibility of tone at all alarm notification devices.
- ix. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test

- x. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points
- xi. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar

1.3.3. FINAL INSPECTION:

At the final inspection, a factory-trained representative of the manufacturer of the major equipment shall demonstrate that the system functions properly in every respect.

1.3.4. INSTRUCTION:

- i. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- ii. The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
1.1	<u>PRELIMINARIES & CONDITIONS OF CONTRACT</u>				
	Allow for mobilization and setting up stores, tools and all necessary equipment on site	1	Item		
1.2	Allow for supply and installation of all labels and danger warning notices, in all personal protective equipment's(PPEs)	1	Item		
1.3	Allow for all preparation of all working drawings (3No. Sets of A2 drawings)	1	Item		
1.4	Allow for the supply and installation of all necessary consumables e.g. Cable makers, ties, etc.	1	Item		
Total Carried Forward to Summary Page					

FIRE ALARM DETECTION AND EVACUATION SYSTEM

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	Supply and Install the following:-				
	<u>FIRE ALARM SYSTEM</u>				
2.1	Addressable Fire Alarm Control Panel, Ten loops, 150 detector&150 module per loop complete with following features and interface modules: fully networkable,BMS interface, voice evacuation with built-in digital amplifier complete with power supply and charger, capability of IP network connection and as Notifier or equal and approved, networkable up to 100 panels/ network, Capability of Speeching, Phone text alerts directly to key personnel with relevant devices, LCD display	2	item		
2.2	Battery Backup with Sealed and maintenance-free, Overcharge protected, Easy handling with leakproof construction, Ruggedly constructed, high-impact case (ABS, polystyrene, or polypropylene, depending on models). Long service life and Compact design	2	No.		
2.3	Repeater addressable fire alarm panel complete with emergency batteries and complete with Module interface as Notifier or equal and approved.	4	No.		
2.4	Loop Control Module with with Up to 12,500 feet (3,810 m) on a Class B (Style 4) SLC loop (twisted-unshielded), Built-in degraded mode, plug-in style installation and Permits multiple loops in small enclosure.	4	No.		
2.5	Supply and installation of Fire Alarm Graphics System with visual display for monitoring and controlling of fire alarm system	1	Item		
2.6	RS485 Communication Module with Class A or Class B networking capability and Hi 485 High-integrity option for critical applications	4	No.		
2.7	power Supply Unit and Backup Power for FACP and Repeater	2	No.		
Total Carried Forward to Summary Page					

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	<p>Supply and Install the following:- Public Address System for Viove Alarm Providing and integrated solution for Back Ground Music (BGM) and Emergency Voice Alarm (EVAC) consisting of the following:</p> <p>Digital Integrated System Manager as the basic unit for Public Address and Voice Alarm System with built-in 1GB flash memory, conect with devixes and the network to extend zone connections ,loudspeaker output, Trigger input/output, Audio input,AVC Input</p> <p>High EfficiencyPower Amplifier with 24VDC Backup Power Supply System</p> <p>Configurable Network Paging Console with 4.3 inch color LCD touch screen, Detachablegoosneck microphone, Built-in monitor loudspeaker and Digital audio processing</p>	2	No.		
	Total Carried Forward to Summary Page				

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	BASEMENT FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
4.1	Addressable optical smoke detectors with isolator base with remote indicator	16	No.		
4.2	Photoelectric Thermal Detectors with inbuilt isolator complete with mounting base	174	No.		
4.3	Manual Call Point complete with Single terminal surface back box for call points	4	No.		
4.4	Fire Telephone Jack	4	No.		
4.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	4	No.		
4.6	Remote Test Station complete with mounting base	2	No.		
4.7	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	GROUND FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
5.1	Addressable optical smoke detectors with isolator base with remote indicator	94	No.		
5.2	Photoelectric Thermal Detectors with inbuilt isolator complete with mounting base	18	No.		
5.3	Manual Call Point complete with Single terminal surface back box for call points	10	No.		
5.4	Fire Telephone Jack	10	No.		
5.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	10	No.		
5.6	Complete Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
5.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	60	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	FIRST FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
6.1	Addressable optical smoke detectors with isolator base with remote indicator	105	No.		
6.2	Addressable Heat and smoke detector	17	No.		
6.3	Manual Call Point complete with Single terminal surface back box for call points	4	No.		
6.4	Fire Telephone Jack	4	No.		
6.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	4	No.		
6.6	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
6.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	58	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	SECOND FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
7.1	Addressable optical smoke detectors with isolator base with remote indicator	108	No.		
7.2	Addressable Heat and smoke detector	18	No.		
7.3	Manual Call Point complete with Single terminal surface back box for call points	4	No.		
7.4	Fire Telephone Jack	4	No.		
7.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	4	No.		
7.6	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
7.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	70	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	THIRD FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
8.1	Addressable optical smoke detectors with isolator base with remote indicator	100	No.		
8.2	Addressable Heat and smoke detector	18	No.		
8.3	Manual Call Point complete with Single terminal surface back box for call points	5	No.		
8.4	Fire Telephone Jack	5	No.		
8.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	5	No.		
8.6	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
8.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	75	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	FOURTH FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
9.1	Addressable optical smoke detectors with isolator base and remote indicator	96	No.		
9.2	Addressable Heat and smoke detector	14	No.		
9.3	Manual Call Point complete with Single terminal surface back box for call points	5	No.		
9.4	Fire Telephone Jack	5	No.		
9.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	5	No.		
9.6	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
9.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	84	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	FIFTH FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
10.1	Addressable optical smoke detectors with isolator base with remote indicator	112	No.		
10.2	Addressable Heat and smoke detector	14	No.		
10.3	Manual Call Point complete with Single terminal surface back box for call points	4	No.		
10.4	Fire Telephone Jack	4	No.		
10.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	4	No.		
10.6	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
10.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	77	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	SIXTH FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
11.1	Addressable optical smoke detectors with isolator base with remote indicator	92	No.		
11.2	Addressable Heat and smoke detector	14	No.		
11.3	Manual Call Point complete with Single terminal surface back box for call points	4	No.		
11.4	Fire Telephone Jack	4	No.		
11.5	Intelligent Wall Mount Sounder Strobe complete with mounting base	4	No.		
11.6	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
11.7	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	59	No.		
Total Carried Forward to Summary Page					-

Item	Description	Qty	Unit	Rate (KSH)	Amount (KShs)
	SEVENTH FLOOR				
	Supply and Install the following:-				
	FIELD DEVICES				
12.1	Addressable optical smoke detectors with isolator base with remote indicator	69	No.		
12.2	Photoelectric Thermal Detectors with inbuilt isolator complete with mounting base	10	No.		
12.3	Addressable Heat and smoke detector	24	No.		
12.4	Manual Call Point complete with Single terminal surface back box for call points	6	No.		
12.5	Fire Telephone Jack	6	No.		
12.6	Intelligent Wall Mount Sounder Strobe complete with mounting base	6	No.		
12.7	Addressable Beam Smoke Detector Complete with mounting box and security kit	1	No.		
12.8	SPEAKER CEILING WHITE with white, ceiling surface-mountable back box	39	No.		
Total Carried Forward to Summary Page					-

ITEM	DESCRIPTION	AMOUNT (KSH)
MAIN SUMMARY PAGE		
1	Total for Preliminaries B/F from BQ Pg. 1	
2	Total for FIRE ALARM SYSTEM B/F from BQ Pg. 2	
3	Total for BGM B/F from BQ Pg. 3	
3	Total for BASEMENT B/F from BQ Pg. 4	
4	Total for GROUND FLOOR B/F from BQ Pg. 5	
5	Total for FIRST FLOOR B/F from BQ Pg. 6	
6	Total for SECOND FLOOR B/F from BQ Pg. 7	
7	Total for THIRD FLOOR B/F from BQ Pg. 8	
8	Total FOURTH FLOOR B/F from BQ Pg. 9	
9	Total FIFTH FLOOR B/F from BQ Pg. 10	
10	Total SIXTH FLOOR B/F from BQ Pg. 11	
11	Total SEVENTH FLOOR B/F from BQ Pg. 12	
Total Carried Forward to Form of Tender		

TECHNICAL SPECIFICATIONS
(ELEVATORS)

1. TECHNICAL SPECIFICATIONS (ELEVATORS)

1.1.1. PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

Deliver the following item to the Construction Work Contractor for installation:

- i. Concrete inserts for support of guide rails.

1.1.2 PRODUCTS PROVIDED BY OTHERS

1.1.2.1 ITEMS PROVIDED BY THE CONSTRUCTION WORK CONTRACTOR

The Construction Work Contractor will provide the following items:

- i. Enclosed hoistway, including structural beams at top of shaft to carry the loads imposed on the building by the elevator equipment.
- ii. Elevator pit of proper depth below the lowest landing including waterproofing and a pit ladder.
- iii. Machine room of sufficient size to accommodate the elevator equipment.
- iv. Sill support angles for each hoistway entrance.

1.1.2.2 ITEMS PROVIDED BY THE ELECTRICAL WORK CONTRACTOR

The Electrical Work Contractor will provide the following items:

- i. Power feeder to machine room, terminating at line terminals of elevator controller.
- ii. Fused disconnect switch or enclosed circuit breaker with auxiliary contact.
- iii. Single-phase circuit for elevator cab lighting, terminating in a fused disconnect switch or circuit breaker in elevator machine rooms.
- iv. Smoke detection system for Phase I - Emergency Recall Operation terminating at a terminal strip cabinet in elevator machine room.
- v. Emergency power signaling conductors from automatic transfer switches to the elevator controller(s).
- vi. Lighting in machine room and elevator pit.

- vii. Telephone wiring terminated in the elevator machine room.
- viii. Thermostatically controlled mechanical ventilation of the elevator machine room.

1.1.3 PRODUCTS FURNISHED BY OTHERS AND INSTALLED UNDER THIS CONTRACT

The following items will be furnished under the Electrical Work Contract for installation under this Contract:

- (a). Public address speaker and backbox for each elevator cab.
- (b). Fire warden telephone jack for each elevator cab.
- (c). Card access control equipment.
- (d). CCTV equipment.

1.1.4 DEFINITIONS

1.1.4.1 Company Field Advisor:

An employee of the company which lists and markets the primary components of the elevator under their name, who is certified by the company to be technically qualified in design, installation, and servicing of the required products, or an employee of an organization certified by the foregoing company to be technically qualified in design, installation and servicing of the required products

1.1.5 SUBMITTALS

1.1.5.1 Submittals Package:

Submit the shop drawings, product data, samples, and quality control submittals specified below at the same time as a package except for the following

- i. Control System Wiring Diagrams (Shop Drawings)
- ii. Test Report (Quality Control Submittal).

1.1.5.2 Shop drawings

- i.** Machine room (layout, size, etc).
- ii.** Hoistway, sections and layouts showing reaction points with reactions
- iii.** Entrance and car details
- iv.** Details of doors, frames, and sills
- v.** Control System Wiring Diagrams
- vi.** Car and lobby fixture details
- vii.** Isolation transformer KVA rating with calculations utilized to determine KVA rating provided.
- viii.** Manufactures machine and emergency brake drawings.

1.1.5.3 Product Data

- i. Manufacturer's catalog sheets, specifications and installation instructions for each component specified
- ii. Motor data shall be certified by the manufacture. Provide calculations utilized to determine horsepower rating provided
- iii. Hydraulic pump data with calculations utilized to determine the gallons per minute rating provided.
- iv. Hydraulic cylinder data with calculations utilized to determine diameter and wall thickness of cylinder provided

1.1.5.4 Samples

- i. Hoist cable (two - 2 foot lengths).
- ii. Governor Cable (two - 2 foot lengths).
- iii. Travel cable (two - 2 foot lengths).
- iv. Stainless steel.
- v. Bronze.
- vi. Handicap access signage.
- vii. Phase I and II procedure signage.
- viii. Color Selections.

1.1.5.5 Quality Control Submittals

- i. Installers Qualifications Data
 - a. Name of each person who will be performing the Work.
 - b. Employer's name, business address and telephone number
 - c. Names and addresses of the required number of similar projects that each person has worked on which has met the experience creteria
- ii. Test Report: Acceptance test report
- iii. Certificate: Affidavit signed by the Company Field Advisor and notarized, certifying that the equipment meets contract requirements and is operating properly

1.1.5.6 Contract Closeout Submittals:

- i. Operation and Maintenance Data: Deliver 2 copies, covering the installed products to the Consultant's Representative. Include lubrication charts, wiring diagrams and instructions. Mount and hang one copy of wiring diagrams in elevator machine room. Each sheet of wiring diagrams shall be laminated in plexiglass.

- ii. Deliver all portable diagnostic keyboards and or programming tools required for testing, service or maintenance to the Consultant's Representative. Include manuals containing all passwords, set up parameters, fault coding and all other operational and maintenance requirements. Contractor shall be able to demonstrate the required functionality of the diagnostic devices

1.1.7 QUALITY ASSURANCE

1.1.7.1 Company Qualification: The Company, installers and supervisors employed to perform the elevator installation works, shall be experienced in elevator Work, and shall have been engaged in the rehabilitation of elevators and have installed the specified elevators for use on this project for a minimum of 3 years.

1. Furnish to the consultant the names and addresses of 5 similar projects, which the specified elevators for use on this project, have been installed during the past 3 years.

1.1.7.2 Product Manufacturer Qualification: If products by Companies other than those specified are proposed for use, furnish the name, address and telephone number of at least 5 comparable installations, which can prove the proposed products have operated satisfactorily for 3 years.

1. Elevator control systems shall be supported by a manufacturer's technical support office staffed with technical field advisors.

1.1.7.3 Company Field Advisor: Secure the services of a Company Field Advisor for the following:

1. Render advice regarding installation, adjustment and operation of equipment.
2. Witness tests and certify with an affidavit that the equipment installed is in accordance with contract documents and is operating properly.
3. Explain available service programs to facility supervisory personnel for consideration.

1.1.7.4 Seismic Design Criteria:

1. Effective peak velocity acceleration (A_v) for Project's location is ___SE___.
2. Design earthquake spectral response acceleration, short period (Sds) for project is ___SE___.

3. Project seismic design category is _____SE_____.

1.8 DELIVERY, STORAGE, AND HANDLING

1.8.1 Packing and Shipping:

Protect equipment and exposed finishes during transportation and erection against damage.

1.9 COORDINATION

1.9.1. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver in time for installation.

1.9.2. Coordinate locations and dimensions of other work relating to the elevator including pit ladders, sumps, and floor drains and sump pumps in pits; entrance sill support angles and beams.

1.10 WARRANTY

1.10.1 Special Manufacturer's Warranty

Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.

1. Warranty Period: _____ from date of Project acceptance.

1.11 MAINTENANCE SERVICE

1.11.1. Initial Maintenance Service:

Beginning upon Project acceptance, provide one year full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

1. Perform maintenance, including emergency callback service, during normal working hours.
 - a. Response Time: Two hours or less.

2.1 ELEVATOR EQUIPMENT

2.1.1 Acceptable Companies

Adams Elevator Equip. Co., ThyssenKrupp Elevator Co., Elevator Equipment Co., Elevator Products Co., Elevator Safety Co., G.A.L. Mfg Corp., Hollister-Whitney Elevator Corp., Imperial Electric Co., Motion Control Engineering M.C.E., Kone Elevator Co., Maxton, Nylube Products Co., Otis Elevator Co., Peele Door, PTL Equip. Mfg. Co. Inc., Schindler Elevator Co., Titan Machine Corp.

2.1.2 Type of Elevator: As per attached BoQ.

1. Rated Load: _____.
- a. Freight Load Classification: _____.
2. Rated Speed: _____.
3. Controller: _____.
4. Operation: _____.
5. Leveling: Two way automatic.
6. Travel: _____.
7. Stops: _____.
8. Openings: _____.
9. Type of Machine: _____.
- a. Roping: _____.
10. Machine Location: Overhead.
11. Machine Room Floor: Concrete.
12. Car Platform Size: _____.
13. Net Car Size (Inside): _____.
14. Hoistway Entrances: _____.
- a. Two speed center opening horizontal slide type.
- b. Center opening horizontal slide type.
- c. Two speed horizontal slide type.
- d. Single speed horizontal slide type.
- e. Vertical bi-parting, counterbalance type.
- f. Vertical slide up type.
- g. Vertical slide down type.
15. Car Doors: _____.
- a. Two speed center opening horizontal slide type.
- b. Center opening horizontal slide type.

- c. Two speed horizontal slide type.
 - d. Single speed horizontal slide type.
 - e. Collapsing horizontal slide gate.
 - f. Single speed slide up type gate.
 - g. Two speed slide up type gate.
- 16. Door Operation: Power.
 - 17. Signals in Car:
 - a. Car position indicator.
 - b. Car operating panel.
 - c. Call registration lights.
 - d. Direction indicators.
 - e. Alarm button and gong.
 - 18. Signals at Landings:
 - a. Position indicators.
 - b. Push button stations.
 - c. Direction indicators.

2.2 PAINTING

2.2.1 Finish ferrous surfaces of the elevator Work with Company's standard multiple coat paint finish, (unless a more stringent finish is specified) including primer and latex enamel finish totaling not less than two coats. Exceptions: Do not paint sliding and rubbing surfaces. Use Company's standard colors, except as otherwise indicated.

2.3 HANDICAP ACCESS SIGNS

- i. Size: Minimum 6 x 6 inches.
- ii. Material: Plastic laminate.
- iii. Message: International Symbol of Access, with:
- iv. Colors:
 - a. Background: Blue.
 - b. Figures or Graphic Symbols: White.

2.4 CODE DATA PLATE

2.4.1. Provide a code data plate in accordance with Section 8.9 of the A17.1 elevator safety code. Attach code data plate to the front of the controller.

3.0 ELEVATOR DOOR OPERATORS

3.1 DEFINITIONS

3.1.1 Elevator Door Operator:

The means of opening and closing of hoistway and car doors at each entrance of elevator.

3.2. POWER CAR/MANUAL HOISTWAY DOOR OPERATORS

3.2.1. Function

Automatically opens and closes car door. Attendant manually operates hoistway doors.

3.2.2 Type:

- i. Car Door: Electric motor driven.
- ii. Hoistway Door: Manual, broken arm type; with provisions for lubrication of pivots and bearing points.

3.2.3. Operation (Car Door):

- i. When the car has stopped at a landing the car door opens automatically. The closing of the car door takes place by continuous pressure on the car door close button or landing push buttons provided the hoistway doors are closed.
- ii. Power opening and closing of the car doors is made smoothly and cushioned at final limits of door travel.
- iii. Power opening of the car door takes place only when the car is stopping, within the leveling zone, or at rest at a landing.
- iv. An electric contact on the car door prevents operation of the elevator unless the car door is closed.
- v. In the event of interruption or failure of power from any cause, the car doors may be opened manually.

3.2.4. Operation (Hoistway Door):

- i. A continuous pull on the handle opens the door. When the handle is released, the door closes to a near closed position and is then checked in motion by an oil door check, to bring the door

to a noiseless and easy stop. An adjustable oil check controls door closing speed and prevents slam.

- ii. A door hold open device holds the doors in the open position. Hold open device consists of a rack fastened to the door sill or head and a spring loaded cam or roller attached to face of door, so that when door is pushed back beyond its normal opening, the cam or roller engages the fixed rack and holds the door in the open position. Door hold open device is released by pushing back on doors to release the cam, permitting doors to close.

3.3. CAR AND HOISTWAY DOOR OPERATORS

3.3.1 Function:

Automatically opens and closes car doors and hoistway doors.

3.3.2 Type:

Electric motor driven, medium-speed, high internal resistance heavy duty direct current master type, complete with door clutch.

3.3.3. Operation:

- i. The car and hoistway doors open automatically when the car reaches the respective landing and again closes either after the expiration of a predetermined time interval or the moment a car button is registered.
- ii. Selective door operation (front and rear openings) causes only the car and hoistway door corresponding to the opening for which the car has been called or sent to open on arrival of the car at that particular opening.
- iii. Power opening and closing of the doors is cushioned or checked, and made quietly and smoothly by the device which opens the car door and hoistway door simultaneously and closes the car door and hoistway door simultaneously.
- iv. Pressing the hall button at the first floor when the car is standing, will reopen the car and hoistway doors.

- v. Pressing the door open push button in the car operating panel reopens the car and hoistway doors.
- vi. An electric contact on the door prevents movement of the elevator away from the landing unless the door is in the closed position.
- vii. A spring closer of the automatic self-closing type insures the self-closing of hoistway door. Spirator type closers are also acceptable.
- viii. Power is not required to hold the doors open or closed.
- ix. The door operator permits the manual opening of both the car and hoistway doors to a maximum of 4 inches when outside of the leveling zone.

3.4 CAR GATE AND COUNTERBALANCED HOISTWAY DOOR ELECTRIC POWER OPERATORS

3.4.1 Function:

Individual power door operators open car gates and hoistway doors.

3.4.2 Type:

1. Car Gate: Electric motor driven.
2. Hoistway Gate: Electric motor driven; equipped with door controller (contacts, resistors, thermal overloads and wiring neatly arranged on panel supported by steel frame).

3.4.3 Operation:

1. When the car has stopped at a landing the car gate and hoistway door open by continuous pressure on car operating panel door open button or landing pushbuttons. The closing of the car gate and hoistway door takes place by continuous pressure on the car operating panel door close button or landing pushbuttons.
2. In the event the car gate meets an obstruction in closing, the gate immediately stops in its downward travel and then reopens. (Reopening device does not project into clear opening when gates are in the open position.)

3.5 DOOR PROTECTIVE DEVICES FOR USE WITH DOOR OPERATORS

3.5.1 Door Protective Device:

Infrared curtain field with "3D" detection zone.

1. Type: Janus Elevator Products, Inc. Pana40 Plus 3D or approved equal.
2. Function: Causes car and hoistway doors to reopen upon penetration of the infrared sensing curtain which protects opening up to a height of 5'-11" above floor.

3.5.2 Door Protective Device:

Infrared curtain field.

1. Type: Adams Elevator Equipment Co.'s (I.C.U. 47/Plus), G.A.L. ScanGard 8000 or approved equal.
2. Function: Causes car and hoistway doors to reopen upon penetration of the infrared sensing curtain which protects opening from 2 inches to 80 inches above floor.

4.0 ELEVATOR CONTROLLER AND OPERATION

4.1. DEFINITION

4.1.1 Controller:

The method of governing the starting, stopping, direction of travel, acceleration, retardation and speed of the elevator.

4.1.2. Operation:

The manner of method an elevator or group of elevators automatically respond to button calls for service, and programmed traffic control.

4.2. PRODUCTS

4.2.1 STATIC MOTOR CONTROL (SCR)

4.2.1.1 Function:

SCR digital motor drive providing full wave rectification to DC hoist motor. Reversing and regeneration shall be accomplished by the armature supply.

4.2.1.2. Type:

Solid state rectification unit, having full wave rectification (360 Hz ripple). Magnetek Elevator Drive or approved equal.

4.2.1.2.1. Drive Controller:

D.C. control panel with full wave microprocessor based regenerative drive in a chassis mounted enclosure. Power conductors must be isolated from the signal wiring with brake and all relay coils suppressed to avoid induction of electrical noise into regulating system.

- a. Equip drive controller with diagnostic and adjustment capabilities via either a handheld tool or on-board controls. Tool shall provide diagnostics, parameter observation, fault readout, operation of drive and digital voltmeter.
- b. Regulation provided by a closed loop static speed regulator utilizing a feed-back tachometer on the hoist motor.

4.2.1.2.2. Harmonic Distortion:

The motor drive shall use the design guide lines of the IEEE-519 in an effort to limit the amount of total demand distortion (TDD). The drive shall achieve a total harmonic distortion of current (THDI) of less than 8%.

4.2.2 DRIVE ISOLATION TRANSFORMER

4.2.2.1. Function:

Reduces line pollution feedback resulting from SCR firing circuits isolating the primary distribution system.

4.2.2.2. Type and Size:

- i. Delta connected primary with wye connected secondary having a minimum of ___ KVA. The primary voltage shall match building distribution voltage and secondary voltage matched to the SCR drive input voltage.
- ii. Transformer shall be specifically sized to the SCR drives KVA requirements, braced to withstand the mechanical stresses of current reversals and short circuits associated with SCR drives. Transformers shall be suitable for continuous operation in a 40 degree C ambient temperature with an 80 degree C temperature rise. Insulation class on windings shall be rated for 220 degree C.
- iii. Transformers shall have copper windings with 2-1/2 percent full capacity taps above and below nominal voltage for incoming source adjustment building system voltage of ___

- Volt 3 phase AC. Equip transformer with sound dampening pads which isolate the core and coil from the case.
- iv. All connections to and from the transformer must employ the use of non rigid conduit for the final electrical connection, with all other conduit supports and clamps provided with neoprene inserts.

4.2.3 CHOKE AND FILTER NETWORK

- i. Provide a choke and ripple filter network sized for the amperage of the SCR motor drive assembly, designed to minimize transient voltages and spikes for noise suppression. Shall have copper coils and 220-degree C. insulation class.
- ii. Choke and filter network shall be installed in a separate ventilated cabinet or may be installed in the controller cabinet.

4.2.4 MICROPROCESSOR LOGIC CONTROLLER

4.2.4.1. **Function:**

Continuously analyze each elevator's changing position, condition and workload. The microprocessor shall constantly scan the system for registered hall calls and will calculate the estimated time of arrival for each car and its assigned hall call.

- i. In calculating the estimated time of arrival the following factors will be used.
 - a. Number of floors to travel from the current position.
 - b. The time it takes to travel one floor at top speed.
 - c. Calls assigned to a car.
 - d. Car reversal time to respond to a call in the opposite direction of travel.
- ii. An internal constant shall be set, requiring a maximum time for a car to respond to a call. When a car status changes or additional hall calls are registered, the estimated time of arrival shall be recalculated and calls reassigned if necessary.

4.2.4.2. **Type:**

Microprocessor based programmable controller with an Erasable Programmable Read Only Memory.

- i. The printed circuit boards (modules) shall be of the type that plug into pre-wired mounting racks. No field wiring or alteration shall be necessary in order to replace defective modules.
- ii. Any field wiring changes required during construction shall be made only to the mounting rack connection points and not to the individual module circuitry or components. If it becomes necessary to alter individual modules, they shall be returned to the factory where such design changes are made and module design records changed so that correct replacement units are available.
- iii. Wiring connections for operating circuits and for external control circuits shall be brought to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce-through serrated washers are not acceptable.
- iv. Safety and Motion Circuits: Electro-Mechanical pilot type relays. Safety circuits are monitored by the microprocessor for redundant protection. All outputs are individually fused.
- v. Identify each device and fuse (ampere rating) on panels by name, letter, or standard symbol, in an approved indelible and legible manner. Coordinate identification markings with wiring diagrams. All logic symbols and circuitry designations shall be in accordance with ASME Standards.
- vi. Incorporate the use of chokes and filter network to minimize transient voltages and spikes for noise suppression. Filters shall be installed in a ventilated 14 gage steel enclosure mounted on top of each drive enclosure.

4.2.4.3. Motion Control:

SCR drive system having a dual-loop digitized feedback regulator utilized to control speed control and based primarily on car position. The velocity profile is calculated by the microprocessor based control system in effect producing extremely smooth and accurate stops. The velocity transducer will permit continuous comparison of machine speed to velocity profile and to actual car speed.

4.2.4.4. Position Selection:

The position selection is an integrated part of the Microprocessor based control system. The car position in the hoistway is digitized through a steel tape running the full length of the hoistway encoded by the car position transducer. The car position transducer detects magnetic leveling strips installed on the tape for floor reference and stopping accuracy. The microprocessor based control system will store the floor position and slowdown points in memory.

4.2.4.5. Performance:

Adjust elevators to meet the following performance requirements:

- i. Running Speed: +/- 5 percent of contract speed under all load conditions.
- ii. Floor to Floor Performance: 11 seconds between typical floors. Time is recorded from start of doors closing until doors are 3/4 open and car is level with floor. Under all load conditions with a 12-foot floor height.
- iii. Door Open Time: 1.7 - 2.7 seconds.
- iv. Door Close Time: 2.4 - 3.5 seconds.
- v. Car Call Dwell Time: 3 seconds, adjustable to 10 seconds.
- vi. Door Nudging Time: 4 seconds, with a 5 second advance signal per ADA standards based on distance. Adjustable to 20 seconds.

4.2.4.6. Emergency Dispatching:

Emergency dispatching operation is activated by loss of communication with group and loss of hall button power.

- i. In the event of communication loss with the group, each car will automatically dispatch to the nearest floor or other dedicated floor.
- ii. With the loss of hall button power, the group internally sets the up and down hall calls at every floor. The cars are dispatched to the floor by the group assignment mechanism.

4.2.4.7. Machine Room Video Monitor, Keyboard and Printer:

Located in dispatch controller in the elevator machine room. The monitor, minimum 15" LCD shall display information in tabular form consisting of, but not limited to the following: Status of

individual input/output devices, slowdown position, operating modes, door status and fault flags.

- i. Diagnostics, Maintenance and Serviceability:
 - a. Keyboard which interacts with Machine Room Video Monitor displays.
 - b. On board Real Time Clock displaying time and date, fully adjustable by on board controls.
 - c. Field programmability of all timer values by on board controls.
 - d. Access to all security codes for alteration and viewing.
 - e. Traffic Studies.
- ii. NOTE: If portable diagnostic keyboards and or programming tools are required for testing, service or maintenance such devices must be proprietary type and turned over to the facility personnel with all reference manuals, including all fault coding and other operational requirements. Contractor shall demonstrate the required functionality of the diagnostic devices.

4.2.4.8. Building Manager Interface Software:

Provide a window's based software package capable of being installed on an existing building computer. The local network connection will be provided by the Facility in each machine room. The software shall enable the user to interface with the server in the machine rooms. The Building Manager interface software shall allow a limited number of functions as follows:

- i. Provide visual display of all elevators.
- ii. Status display.
- iii. Floor and door position.
- iv. Permit various security functions to enable locking out of calls.

4.2.4.9. Interfacing:

All interfacing between the central processing units and transducers, feedback loop shall be shielded cable installed in individual raceways.

4.2.4.10. Fault Protection System:

- i. Protect against the following:
 - a. Complete power circuit from failure under short circuit.
 - b. Surge protection.
 - c. Overload.
 - d. Low voltage, phase loss, unbalanced voltage.

4.2.5 FLUX VECTOR (VVVF) AC MOTOR CONTROL**4.2.5.1. Acceptable Manufacturers:**

Baldor Electric Co., Magnetek Elevator Drive or approved equal.

4.2.5.2. Function:

- i. The flux vector drive shall produce optimum motor torque from rated speed down to zero speed.
- ii. Stepless acceleration and deceleration.
- iii. Direct drive optical digital type, closed loop velocity encoder on hoist machine. Update car position at each floor and automatically restore after power loss.

4.2.5.3. Motion Control:

- i. Digital feedback regulator utilized to control speed control and based primarily on car position. The velocity profile is calculated by the microprocessor, in effect producing extremely smooth and accurate stops. The velocity transducer will permit continuous comparison of machine speed to velocity profile and to actual car speed.

4.2.5.4. Enclosure Assembly:

- i. Type: Wall mounted dead back or free standing, housing controller components with integral fan and filtered vent perforations.
- ii. Fabrication:
 - a. Frame: Angle iron.
 - b. Covering: Sheet metal, enclosing top and sides.
 - c. Doors: Sheet metal, front and rear, hinged for access to components, with latches and locks, including filtered slots for ventilation.
- iii. Component Mounting Panels:

Mount inverter contacts, relays and microprocessor on common panel.

- a. Panel Material: Phenolic or polyester, thickness as required to support components.
- b. Panel Braces: Metal angle bars attached to frame.

4.2.5.4. Components and Operating Devices:

- i. Motor Drive:
 - a. Control of three phase AC induction motors shall be performed through the use of a high resolution encoder.
 - b. Full-wave bridge rectifier to provide a DC voltage supply for the solid-state inverter.
 - c. Pulse width modulation.
 - d. Fully adjustable to match the AC motor characteristics.
 - e. RFI Filters - (Radio Frequency Interference).
 - f. Diagnostic tool for maintenance. (On board devices are acceptable).
- ii. Inverter:
 - a. Insulated Gate Bipolar Transistors (IGBT's).
 - b. Frequency accuracy of 0.01 percent.
 - c. Closed loop design.
 - d. Adjustable voltage/frequency ratio.
 - e. Stall prevention.
 - f. Slip compensation.
 - g. Regenerative power absorption.
 - h. Electronic thermal motor overload protection.
- iii. NOTE: Elevator controller must be fully protected against over and under voltage conditions without damage to any circuit boards, relays or electronic devices. Memory and initial parameters must be retained in non-volatile memory for protection during power outages.

4.2.6 SIMPLEX SELECTIVE COLLECTIVE OPERATION

4.2.6.1. Function:

Operating devices consisting of a series of dispatch buttons in the car operating panel corresponding to the landings served and a single riser of landing hall buttons, electrically connected to controller, govern floor selection and direction of travel.

4.2.6.2.Operation:

- i. When car is idle and one or more car or landing buttons above the landing at which car is standing is pressed, the car starts in the Up direction. The car stops on the Up trip at each landing for which a car button or Up landing button is pressed sufficiently in advance of the car arrival at such landings to permit these stops to be made. After each stop, the car proceeds in the Up direction until it reaches the highest landing for which a car or landing call is registered. Stops are made in the order in which the landings are reached, irrespective of sequence in which buttons have been pressed. The car will not stop on the Up trip at any landing in response to a Down landing call unless this call is the highest call registered. Similarly, if car is idle and one or more landing buttons below the landing at which the car is standing are pressed, the car starts in the Down direction, proceeding to the lowest landing for which a button is pressed and stops at each intermediate landing for which car button or Down landing button is pressed.
- ii. When the car is idle and a button above the car and a button below the car is pressed, the car starts toward the landing corresponding to the button first pressed. The call registered for the landing in the opposite direction from the car will be answered after the car has responded to the farthest call in the direction established by the first button pressed.
- iii. The minimum time from audible and signal notification that the elevator car is answering a landing call until the doors start to close is 6 seconds (doors fully open for a minimum of 3 seconds), to enable passengers to enter or leave the car. Pressing a car button for another landing before this time elapses, causes the car to start, provided the car door and hoistway doors are closed and interlock circuits established. When the car has answered the farthest call, this interval will permit a car button call to be registered to establish the direction of car travel, even if other landing calls are registered.
- iv. When all calls have been answered, car remains at landing last served.

- v. When all calls have been answered, the car returns to the main floor or other designated landing.

4.2.7 DUPLEX SELECTIVE COLLECTIVE OPERATION

4.2.7.1. **Function:**

Operating devices consisting of a series of dispatch buttons in the car operating panel corresponding to the landings served and a single riser of landing hall buttons, electrically connected to controller, govern floor selection and direction of travel.

4.2.7.1.. **Operation:**

- i. One car normally “parks” at the main floor and the other, a “free” car at the landing last served.
- ii. “Free” car answers landing calls either above or below the landing at which car is standing except main floor landing calls.
- iii. When “free” car is clearing calls, the other car automatically starts to answer landing calls under any of the following conditions:
 - a. Registration of an Up call from a landing below the “free” car while it is traveling up.
 - b. Registration of an Up or Down call from a landing above the “free” car while it is traveling down.
 - c. Inability of “free” car to clear all registered landing calls within approximately 40 seconds, or to move in response to registered landing calls within this time limit.
- v. When car has been started either in response to car button or landing calls, the car responds to its own car button calls and to landing calls registered for the direction in which car is traveling in the order in which landings are reached, irrespective of the sequence in which calls are registered. When both cars are clearing calls only one car stops in response to any one landing call. The first car clearing all its calls returns to main floor. Should both cars finish their calls at the main floor, the car arriving first becomes the “free” car.
- vi. The minimum time from audible and signal notification that a specific elevator car is answering a landing call until the doors start to close is 6 seconds (doors fully open for a minimum of 3

- seconds), to enable passengers to enter or leave car. Pressing a car button for another landing before this time elapses, causes the car to start, provided the car door and hoistway doors are closed and interlock circuits established. When a car has answered its furthest call, this interval permits a car button call to be registered to establish the direction of car travel, even if other landing calls are registered.
- vii. If either car is removed from service, the other car answers all its own car calls and all landing calls.
 - viii. Car will not start in answer to car or hall calls unless car doors and hoistway doors are closed and locked, and interlock circuits established.

4.2.8 AUTOMATIC GROUP SUPERVISORY OPERATION

4.2.8.1. Type:

Microprocessor; providing the lowest average waiting time for all passengers in a given interval. Traffic data shall be continuously gathered and stored. Hall calls, car calls and landing car stops shall be monitored and recorded to provide a data base from which these factors can be assessed and applied to the algorithm. The system automatically adjusts dispatching to respond to traffic pattern changes and reassigns high density traffic areas based on actual traffic, without software reprogramming.

- i. The following parameters provided by the continuously gathered historical traffic data shall be considered:
 - a. Probable Stops and Destination.
 - b. Hall Call Arrival Rates.
 - c. Peak Operation Status.
 - d. Car Parking.
- ii. In allotting and reallotting parameters, the following physical and statistical parameters shall be considered:
 - a. Car Service Status.
 - b. Long Wait Calls.
 - c. Power Status.
 - d. Car Calls Status.
 - e. Door Status.
 - f. Car Load.
 - g. Coincident Calls.
 - h. Car Position.
 - i. Motion Status.

4.2.8.2. Function:

Operating devices consisting of a series of dispatch buttons in the car operating panel corresponding to the landings served and two riser of landing hall buttons, one in each group electrically connected to the controller, govern floor selection and direction of travel.

- i. Registration of a landing call from either riser of landing hall buttons causes a car to stop at that floor for the direction in which the call was registered.

4.2.8.23. Operation:

- i. Upon entering car, passengers press car dispatch buttons corresponding to landing to which they wish to go. After door interlock circuits are established, the car automatically starts, accelerates, slows down and stops at first landing for which a car dispatch button has been pressed, or which a landing call has been registered corresponding to direction in which car is traveling. Car continues to serve remaining car dispatch and landing calls in the order the landings are reached, regardless of manner buttons are pressed, provided button for given landing has been pressed sufficiently in advance of car arrival at that landing to permit slow down and stop.
- ii. Car and hoistway doors open automatically when car stops at an intermediate landing and close at a predetermined time interval after opening, unless closing is interrupted by car door reversing device or door open button. Car automatically starts following full closing of doors.
 - a. The minimum time from audible and signal notification that a specific elevator car is answering a landing call until the doors start to close shall be as established in the Americans with Disabilities Act.
- iii. Elevators operate no higher than necessary and in presence of demands for service below Up traveling cars, elevator reverses at highest car call or down landing call or, if neither exists, at the next landing at which normal stop may be made.
- iv. Intermittent Two-Way Traffic: This type of traffic shall be determined through historical data and current hall calls entered throughout the building.

- v. Parking Feature: Arrange a variable number of cars to park at designated main entrance floor, with doors open and hall lantern illuminated.
 - a. When an elevator is in service and available the microprocessor control system shall have the ability to dispatch the car to any floor.
- vi. Heavy Up Traffic: Recognized through historical data and by current conditions for changes in passenger loads, the number of calls entered at the lobby, the number of cars departing the lobby which are compared to the activity throughout the building. A high priority shall be placed on providing a car at the lobby to avoid lobby congestion. The cars shall depart when the loading time has expired or the load weighing device senses that the car is full. The lobby loading time shall be determined by the number of car calls, passenger load and the door courtesy time.
- vii. Heavy Two-Way Traffic: This traffic pattern shall be recognized through historical data and when the current hall calls are entered throughout the building without a consensus of direction. All cars available for group operation shall be brought into operation to minimize waiting time.
- viii. Heavy Down Traffic: This traffic pattern shall be recognized through historical data and the current entry of hall calls. Down hall calls shall be allotted to provide service to the traffic while achieving the lowest average waiting time for all passengers within a given interval.
- ix. Fail Safe Operation: Continuity of service feature shall keep the elevator running in case of certain failures. This feature shall be effective only when cars are operating on automatic mode and become effective automatically when certain failures occur. The operation shall be as follows:
 - a. Central Dispatch Computer Failure: Communication failure with the Central Dispatch Computer shall result in reverting to a pre-arranged and adjustable operation.
 - b. Failure of Car to Start: Car start failure shall result in the car being from service and its assignment given to another available car.
 - c. Failure of Hall Pushbutton Circuit: Hall pushbutton circuit failures shall result in registering down hall calls and lobby up hall calls and shall then proceed to answer the calls in the most efficient manner possible.

- x. Traffic Analysis Information:
 - a. The computer system shall be capable of providing traffic analysis for all elevators in the group.
 - b. The traffic analysis shall provide a display of hall calls waiting times and cars in and out of service. A hard copy report shall also be available.

4.2.9 ADDITIONAL CONTROL FEATURES FOR EACH ELEVATOR

4.2.9.1. Top of Car Operating Device:

- i. Function: Used for inspection and maintenance procedures.
- ii. Design: Up and Down direction buttons and emergency stop button in metal enclosure, equipped with a flexible type cord with strain relief device at both connections.
- iii. Operation:
 - a. Control of the elevator is transferred to the top of car operating device by means of a transfer switch located on the car top between the car crosshead and the side of the car nearest to the hoistway entrance normally used for access to the car top.
 - b. Car is operated by constant pressure on appropriate direction button, and by simultaneously pressing a safety button.
 - c. Car will not operate unless both buttons are pressed.

4.2.9.2. Stop Switch in Elevator Pit and Overhead Sheave space:

- i. Function: Removes car from service during inspection and maintenance procedures. (Car cannot be operated).
- ii. Design: Metal enclosure, housing red button (positively open mechanically, opening not solely dependent on springs). Permanently mark button, indicating Stop and Run positions.

4.2.9.3. Automatic Leveling:

- i. Function: Causes elevator to make accurate stops at each landing and makes adjustments to keep elevator within specified tolerances at the landing.
- ii. Operation:
 - a. Adjusts elevator if car is more than 1/4 inch above or below landing level when the car has come to

rest at any landing, irrespective of load in car within specified capacity and irrespective of direction of travel.

- b. If car is displaced from the floor for any reason other than operation of control buttons, the car returns automatically to a position, level with the landing within 1/4 inch above or below.

4.2.9.4.Independent Service:

- i. Function: Causes car to operate only from its car button, and becomes independent of the hall buttons.
- ii. Operation:
 - a. When key operated switch is in On position car is removed from normal style of operation.
 - b. All previously registered car calls are cancelled.
 - c. Car door and hoistway door remain open when car is at a floor, until a car button for another landing is momentarily pressed.
 - d. If several calls are registered after each stop, a car button must be pressed to effect door closing.
 - e. Previously registered hall calls shall not be cancelled, but answered when car is back in normal automatically operation.

4.2.9.5.Emergency Hospital Service:

Equip hall pushbutton station at each floor with keyswitch and signal light to permit an available elevator to be called to that landing thereby canceling all car calls and bypassing all hall calls upon actuation. Upon arrival, doors open for a predetermined time to permit the car to be placed on Emergency Hospital Service. The signal lights shall illuminate while a car is responding to a priority call and will be extinguished when the car has been placed on Emergency Hospital Service or has been returned to normal service. If there is no car available for this priority service, the signal lights shall remain illuminated until a car becomes available to receive a priority service call. Another priority call cannot be initiated until the signal lights are extinguished.

4.2.9.6.Load Weighing Device:

- i. Function: Prevents given percent loaded car from making unnecessary stops.

ii. Operation:

- a. Device automatically weighs load on car platform and, if loaded, car by-passes all landing calls.
- b. Landing calls remain registered for next available car.
- c. Weighing device does not affect the stopping of car at any floor in answer to registered car calls.
- d. Adjustable type.

4.2.9.7. Anti-Nuisance Feature:

i. Function:

Arrange the elevators so that in the event more car calls are registered than a corresponding passenger load in the car, all car calls shall be cancelled so that registration of proper number of car calls are made.

4.2.9.8. Position Selection:

The position selection is an integrated part of the microprocessor based control system.

- i. Proximity switches activated by vanes mounted in the hoistway for stepping, leveling, and door zone sensing.
 - a. Switches installed in steel enclosure mounted on car.
- ii. Steel tape mounted in hoistway to include complete travel of elevator. Car top assembly with tape guides, tape sensors, and magnetic strips for stepping and leveling.
- iii. Steel tape mounted in hoistway to include complete travel of elevator car. Car position transducer, with tape guides and magnetic or optical switches, provides controller with digitized information of precise car position.
- iv. Car top mounted car position transducer, which rides on guide rail provides controller with digitized information of precise car position in conjunction with hoistway mounted magnetic switches and sensors.

4.2.9.9. Cross Cancellation Panel:

i. Function:

Designed to temporarily integrate both the existing control system with the new control system to prevent dispatching of both control systems from the same hall calls. This shall remain connected until all elevators in a group are complete.

- ii. Type: Microprocessor based or relay logic.
- iii. Design: Contractor shall verify voltage and power requirements of both the existing and new control systems to ensure compatibility.

5.0 ELEVATOR LANDING SIGNAL EQUIPMENT

5.1 DEFINITIONS

5.1.1. Landing Signal Equipment:

Buttons, lanterns, indicators or other devices located at landings, operating in conjunction with elevator control equipment to call elevator to that floor and indicate the stopping and direction of elevator travel.

5.2 PRODUCTS

5.2.1 POWER SUPPLY

Transformers or rectifiers to suit signal equipment electrical parameters.

5.2.2 LANDING FIXTURES

5.2.2.1.Hall Buttons - Flush Mount:

- i. Faceplate: Stainless steel; 14 gage minimum, No. 304 with dull satin finish No. 4.
- ii. Backbox: steel, 16 gage.
- iii. Button Construction: Mechanical vandal resistant type, stainless steel having positive stop contacts.
- iv. Pictograph: Equip upper portion of faceplate with engraved, red epoxy filled hall station pictograph "H1" from the ASME A17.1 Elevator Code. (Pictograph wording shall read "IN FIRE EMERGENCY, DO NOT USE ELEVATOR, USE EXIT STAIRS" accompanied by corresponding pictograph)

5.2.2.2. Hall Buttons - Surface Mount:

Elevator Products Corporations, "Inchline Signal Fixtures" or approved equal, having:

- i. Faceplate: Surface mounted one piece, sized to conceal all voids of wall construction eliminating the need for additional blank faceplates, stainless steel with satin finish; 14 gage minimum. Edges of faceplate shall have a radius contour leaving a smooth finished appearance. Equip upper portion of faceplate with engraved, red epoxy filled hall station pictograph "H1" from the ASME A17.1 Elevator Code. (Pictograph wording shall read "IN FIRE EMERGENCY, DO NOT USE ELEVATOR, USE EXIT STAIRS" accompanied by corresponding pictograph). Utilize 16 gage minimum cold rolled steel backplate
- ii. Button Construction: Mechanical stainless steel type with illuminating halo, having contacts and wearing parts of material and design to meet the severe requirements of elevator service.

5.2.2.3. Call Register Light:

- i. Style: Integral with push button so that button is illuminated when call is registered.
- ii. Operation: When the button is pressed, the indicator or button illuminates indicating that a call is registered. When call is answered, the indicator is extinguished.

5.2.2.4. Hall Lanterns - Flush Mount:

- i. Design - L.E.D. Digital Type:
 - a. Faceplate: Stainless steel; No. 304 with dull satin finish No. 4.
 - b. Backbox: Steel, 16 gage.
 - c. Characters: Minimum surface measurement; 2-1/2 inches in the smallest dimension.
 - d. Gong or Chime: Integral.
- ii. Operation:
 - a. Illumination of appropriate arrow indicates the impending arrival of car and direction.
 - b. Gong sounds once when upper arrow illuminates. Gong sounds twice when lower prism illuminates.

c.

5.2.2.5. Hall Lanterns – Surface Mount:

C.E. Electronics Incorporated, “Turnkey Surface Mount Displays” with the following:

- i. Design: Segmented type, arrows not less than 2-1/2 inches high with smaller side arrow indicators incorporated into projecting prism
- ii. Faceplate: Surface mounted stainless steel with satin finish.
- iii. Operation: As car arrives at floor arrow illuminates and chime sounds indicating direction of travel.
- iv. Gong or Chime: Upon arrival at floor, an audible chime shall sound corresponding with appropriate arrow illumination indicating direction of travel. Chime shall sound once in “up” direction of travel and twice in “down” direction direction of travel.

5.2.2.6. Hall Position Indicators:

- i. Design: L.E.D. Digital Type.
 - a. Faceplate: Stainless steel; No. 304 with dull satin finish No. 4.
 - b. Characters: Not less than 2 inches high.
- ii. Operation: As car passes through hoistway, its position is indicated by illumination of the numeral corresponding to the landing at which the car is stopped or passing. Arrows illuminate to indicate direction of travel. “Up” direction arrow illuminates white; “Down” direction arrow illuminates red.

5.2.2.7. Hall Position Indicators:

- i. Design: L.E.D. Digital type, characters not less than 1/2 inch high, integral with hall button face plate.
- ii. Operation: As car passes through hoistway, its position is indicated by the illumination of the numeral corresponding to the landing at which the car is stopped or passing.

5.2.2.8. Combination Hall Lantern and Position Indicator:

- i. Design: L.E.D. Digital Type.
 - a. Faceplate: Stainless steel; No. 304 with dull satin finish No. 4.
 - b. Characters shall be not less than 2-1/2 inches.
 - c. Audible Indicator: Integral chime or gong.

- ii. Operation: Indicators announce, by both audible and visual means, an impending car arrival and indicates the position and movement of the car in the hoistway at all times.
 - a. As the car travels through the hoistway, its position is indicated. Arrows illuminate to indicate direction of travel.
 - b. Audible indicator sounds once when upper visual indicator illuminates. Audible indicator sounds twice when lower visual indicator illuminates.

5.2.2.9.Lobby Display Panel:

- i. Faceplate: Stainless steel with satin finish equipped with tamper resistant fasteners suitably sized for all equipment. Divide dispatch panel into 2 sections; each section equipped with concealed hinges and cylinder lock. Containing the following:
 - 2. Upper Section: 17 inch LCD flat monitor located behind lexan lens in door. Monitor shall display the car position graphically and numerically displayed and the following as a minimum:
 - a. Floor number.
 - b. Up and down hall calls.
 - c. Car door status.
 - d. Direction of car travel.
 - e. Car out of service status.
 - 3. Lower Section: Accommodate the following switches and controls:
 - a. Switches: Security type. Coordinate keying requirements with the Facility. Furnish 10 keys per core.
 - b. Emergency Power Selector Switch Cabinet and Controls.
 - c. Phase I Emergency Service key switch. FEO National Standard key.
 - 4. Backbox: Steel, 16 gage.
 - 5. Engraving: Black epoxy filled ¼ inch high characters for all switches except red epoxy filled engraving for Phase I Emergency Service key switch and instructions.

6.0 ELEVATOR EMERGENCY OPERATION AND EMERGENCY SIGNAL DEVICES

6.1 SYSTEM DESCRIPTION

- 6.1.1. The elevator emergency operation and emergency signal devices enable elevators to be operated under fire or other emergency condition.
- 6.1.2. Passengers in elevator cars may communicate with the _____ via a hands free auto-dialer telephone system.
- 6.1.3. The elevator mechanic/emergency personnel may communicate with each elevator car via the machine room phone system or the master base station at the designated landing.
- 6.1.4. Phase I - Firefighters Emergency Operation: A three position (reset, off, on) key operated switch at the designated floor enables elevators controlled by the switch to be secured under fire or other emergency conditions:
1.Operation of Phase I Firefighters Emergency Operation shall be in accordance with ASME A17.1 Rule 2.27.3.
- 6.1.5. Phase II - Emergency In-Car Operation: A three position (off, hold, on) key operated switch in or adjacent to each car operating panel becomes effective only when the Phase I switch has been turned to the "on" position or a smoke detector has been activated.
1.Operation of Phase II - Emergency In-Car Operation shall be in accordance with ASME A17.1 Rule 2.27.3.3.
- 6.1.6. Failure of a.c. operating power to normal elevator lighting fixtures automatically causes a battery powered emergency light to illuminate.
- 6.1.7. Failure of a.c. operating power to alarm bell automatically causes bell to operate from battery source when emergency call button is pushed.
- 6.1.8. Passengers in a stalled elevator can determine car location by referring to floor numbers on the hoistway door and on the walls of the elevator shaft.
- 6.1.9. Upon failure of normal electric service to the elevators, an emergency electric service (standby generator) powers the elevators on a limited, priority basis.
Sequence of operation:
1. Upon transfer to emergency power, the elevator dispatch controller receives a signal from the automatic transfer switch and activates the emergency dispatching function; One elevator at a time per group will be dispatched automatically, sequentially

to the designated floor lobby. At no time shall more than one elevator be operational. A manual selector switch at the designated floor allows emergency personnel to override the automatic sequencing during the emergency stand-by power mode. Upon restoration of normal power, the automatic transfer switch sends a pre transfer signal to the elevator dispatch controller and the elevators stop one at a time at the nearest floor and revert to normal operation. If the automatic dispatching function was overridden via the manual selector switch in the designated floor dispatch panel the manual station must be reset to the automatic position and the elevators will revert to normal operation mode.

6.3 PRODUCTS

6.3.2 EMERGENCY LIGHT AND ALARM SYSTEM

6.3.2.1 Light and Alarm Unit, having:

1. Minimum of 2 lamps. (Not less than 0.2 foot candles 4 feet above car floor and 1 foot in front of car station).
2. Six inch alarm bell. (Operated by emergency alarm button located in car operating panel).
3. Sealed nickel cadmium type batteries of capacity to maintain light intensity for minimum of 4 hours, and ring the 6 inch alarm bells for 1 hour. Two bells shall be provided, one mid-point in the hoistway and one in the hoistway at the designated floor.
4. Battery charger as recommended by manufacturer.

6.3.3 PROCEDURE SIGN

6.3.3.1 Instructions for the operation of the elevators under Phase I and Phase II conditions:

1. Locate instructional signage adjacent to the designated floor Phase I key switch engraved in hall station faceplate. Locate engraved red epoxy filled instructional signage in the car operating panel adjacent to the Phase II switches.
2. Lettering not less than 1/4" in height.

6.3.4 TELEPHONE COMMUNICATION SYSTEM

6.3.4.1. **In-Car Telephone:**

Rath Microtech smartphone model 2100 or approved equal. Mount auto dialer telephone behind main car operating panel faceplate within prescribed height of controls. Coordinate mounting studs, visual indicator, speaker perforations and activation button locations with telephone manufacturer.

6.3.4.2. **Machine Room Telephone:**

Rath Microtech Model No. 2300-630RC or approved equal. Provides two-way communication to each individual elevator car.

6.3.4.3. **Master Base Station:**

Rath Microtech Model No. 2500-28RCF or approved equal. Provides two-way communication to each individual elevator car.

6.3.4.4. **Distribution Module/Power Supply:**

Rath Microtech distribution module and RP7700104 power supply with battery back- up.

6.3.4.5. **Telephone Lines:**

Wiring from the telephone interconnection cabinet to the machine room telephone modular phone jacks shall be provided by the Facility.

6.3.5 EMERGENCY IDENTIFICATION SIGNAGE

6.3.5.1. The driving machinery, disconnect switch, controller, transformer, car operating panel, lobbies and crosshead of each elevator shall be identified with corresponding numbers as shown on plans. In addition, a warning sign shall be mounted on disconnect switches of multiple elevators and read as follows: "Warning - Parts of the control panel are not de-energized by this switch."

6.3.5.2. Numerals and signage shall be a minimum of a 2 inches high and applied with paint or nameplate.(Exception: Car operating panel lettering shall be 1/2 inch high engraved).

6.3.5.3. Each elevator entrance of each elevator shall contain elevator identification to be engraved with contrasting letters/ numbers on to a

metal plate having two inch high letters. The plate shall be installed over each entrance, either on transom or wall surface.

6.3.6 VOICE ANNOUNCER

6.3.6.1. Voice Synthesizer:

1. Operation: Produces speech in pleasant, natural sounding female voice from vocabulary stored in memory.
2. Features:
 - a. Audible Device: Voice announcer, microprocessor based equipment.
 - b. Speaker: 8 ohms. Mount speaker in car operating panel.
 - c. Speed: Variable, adjustable to speed of car.
 - d. Power Supply: As required for supply voltage.
 - e. Volume Control: Adjustable.
3. Vocabulary: Programmable, stating:
 - a. Floor arrival announcement and direction of travel.
 - b. Special Emergency Service (Phase I Key Switch Turned On): Announces "This elevator is needed for an emergency. Please exit when the doors open."

6.3.7 EMERGENCY ELECTRIC SERVICE ACCESSORIES

6.3.7.1. Manual Selector Switch for Selective Operation of Elevators:

Located at designated floor.

1. Enclosure: Lockable, recessed, to match decor. Equip with illuminating "Emergency Power" signal which illuminates during periods of emergency power.
2. Operation: Interlocked strip switch. One of the buttons shall be labeled "Auto" and shall be the default position for the automatic sequencing operation. The remaining buttons shall be interlocked so that not more than one button may be depressed at any time. The "Auto" button shall not be able to be depressed while any of the other buttons are depressed. If the "Auto" button is depressed the remaining buttons will return to their normal position simultaneously.

3. Key: FEO National Standard.
4. Label switch with red epoxy filled characters.

6.3.7.2. Automatic Operation for Selective Operation of Elevators:

1. Equip controllers with necessary relays and wiring for automatic operation of one elevator at a time under emergency power. Equip dispatch controllers with signaling provisions and corresponding logic to communicate with other dispatch controllers in the building. Control wiring from automatic transfer switch to machine room shall be provided by the Electrical Contractor.
2. Equip the elevator controllers for all elevators with provisions and circuitry to allow the elevators to operate at a field adjustable reduced speed while under periods of emergency power.

6.3.8 PUBLIC ADDRESS SYSTEM

6.3.8.1. Public Address Speakers:

Provide all elevators with mounting devices and wiring to each cab from hoistway junction box for installation of public address speakers. (Speakers Furnished by others).

7.0 ELEVATOR WIRING

7.1. REFERENCES

1. EN, ASME, and UL.

7.2 CONDUCTORS (600 VOLTS AND UNDER) AND ACCESSORIES

7.2.2.1. Date of Manufacture:

No insulated conductor over one year old when delivered to the site will be acceptable.

7.2.2.2. Conductors:

Annealed uncoated copper or annealed coated copper in conformance with the applicable standards for the type of insulation to be applied on the conductor.

7.2.2.3. Insulation:

1. Types for General Application:
 - a. Type XHHW: Moisture and heat resistant cross-linked polyethylene insulation rated 600V conforming to U.L. requirements for type XHHW insulation (75 degrees C Wet and 90 degrees C dry).
 - b. Type THWN: Polyvinylchloride insulation rated 600V with nylon jacket conforming to U.L. requirements for type THWN insulation (75 degrees C).
 - c. Type THHN: Polyvinylchloride insulation rated 600V with nylon jacket conforming to U.L. requirements for type THHN insulation (90 degrees C).
2. Types for Specific Application:

As required by Article 620 of the National Electrical Code.
3. Traveling Cables:
 - a. Type: Elevator cables as listed in Article 400, Table 400-4 of the National Electrical Code.
 - b. Insulation Thickness: Suitable for the voltage to which the cables are subjected.
 - c. Minimum Size:
 - 1) Lighting Circuits: No. 14 AWG.
 - 2) Operating, Control, Signaling and Communication Circuits: No. 18 AWG.
 - d. Shielded Twisted Pairs: No. 20 AWG; Number and style to suit operating, control, signaling and communication circuit requirements, minimum of 6 pair.
 - 1) Provide number required for fire speaker and fire telephone circuit requirements: No. 20AWG.
 - e. Coaxial Cable: RG6/U with mechanical properties to protect against deformation.
 - f. Spare Conductors: Not less than 10 percent.

7.2.2.4. Splice Connectors:

1. **Spring Type:**
Amerace Corp. Elastimold Div.'s Buchanan B-Cap, Electrical Products Div./3M's Scotchlok Type Y, R, G, or B, Ideal Industries Inc.'s Wing Nuts or Wire Nuts, or Thomas & Betts Corp.'s Piggies.
2. **Indent Type with Insulating Jacket:**
Amerace Corp. Elastimold Div.'s Buchanan Pressure Connectors, Ideal Industries Inc.'s Crimp Connectors, or Thomas & Betts Corp.'s STA-KON.

7.2.2.5. Terminals:

Nylon insulated pressure terminal connectors by Amp Special Industries, Burndy Corp., Ideal Industries Inc., Panduit Corp., Thomas & Betts Corp., or Wiremold Co.

7.2.2.6. Lugs:

1. **Single Cable (Compression Type Lugs):**
Copper, one or 2 hole style (to suit conditions), long barrel; Burndy Corp.'s Hylug YA, Ideal Industries Inc.'s CCB or CCBL, or Thomas & Betts Corp.'s 54930BE or 54850BE Series.
2. **Single Cable (Mechanical Type Lugs):**
Copper, one or 2 hole style (to suit conditions); Burndy Corp.'s Quicklug Series, or Thomas & Betts Corp.'s Locktite Series.

7.2.2.7. Insulation Tapes:

1. Plastic Tape: Bishop Electric Corp.'s No. 85, Electrical Products Div./3M's Scotch 88, Plymouth Rubber Co.'s Premium CW.
2. Rubber Tape: Bishop Electric Corp.'s No. W-963, Electrical Products Div./3M's Scotch 23, or Plymouth Rubber Co.'s Splicing Compound ASTM.

7.2.3 OUTLET, JUNCTION AND PULL BOXES**7.2.3.1. Galvanized Steel Boxes For Concealed Work:**

Standard type galvanized steel boxes and device covers by Appleton Electric Co., Electrical Products Div. Midland-Ross (Steel City), or Raco Inc.

7.2.3.2. Galvanized Steel Junction and Pull Boxes For Exposed Work:

Code gage, galvanized steel screw cover boxes by Gray Metal Products Inc.'s, Hoffman Engineering Co., Keystone Columbia Inc., or Queen Products Co. Inc.

7.2.3.3. Threaded Type Boxes For Exposed Work:

Malleable iron with cadmium or galvanized finish by Appleton Electric Co., Crouse-Hinds Co., or OZ/Gedney Co.

7.2.3.4 Specific Purpose Outlet Boxes:

As fabricated by equipment manufacturers for mounting their equipment.

7.3.4 SUPPORTING DEVICES

7.3.4.1. "C" Beam Clamps:

1. For 1 inch Conduit Maximum: Caddy Fastener Div./Erico Products Inc.'s BC-8P and BC-8PSM Series, or HIT Spring Steel Fasteners Inc.'s CH Series.
2. For 3 inch Conduit Maximum: Appleton Electric Co.'s BH-500 Series beam clamp with H50W/B Series hangers, Kindorf Elec. Prod. Div./Midland Ross Corp. 500 Series beam clamp with 6HO-B Series hanger, or OZ/Gedney Co.'s IS-500 Series beam clamp with H-OWB Series hanger.

7.3.4.2. Fastening Fittings for Existing Masonry:

Kindorf Elec. Prod. Div./Midland Ross Corp. E-243, E-244, E-245, E-170, Unistrut Corp.'s P2682, or Versabar Corp.'s VX-4310, VX-2308, VX-4308, VX-4309.

7.3.4.3. Pipe Straps:

Two hole steel conduit straps with Galv-Krom finish; Kindorf Elec. Prod. Div./Midland Ross Corp. C-144 or C-280 Series.

7.3.4.4. Pipe Clamps:

One hole malleable iron type clamps; Kindorf Elec. Prod. Div./Midland Ross Corp. HS-400 Series, or OZ/Gedney Co.'s 14-50 Series.

8.0 EXECUTION

8.1 ELEVATOR INSTALLATION EXECUTION

8.1.1 INSTALLATION

8.1.1.1. Handicap Access Signs:

Mark accessible elevator routes which are accessible for those with mobility disabilities.

1. Signs: Install 1 sign on each floor in locations deemed to be the most strategic and conspicuous. Mount signs 5 feet above floor (centerline of characters) at all interior and most exterior locations. Mount signs with manufacture's adhesive strips

8.1.2 PREPARATION

8.1.2.1. Protection:

Protect exposed equipment, door operators, car safeties, guide shoes, interlocks and limit switches from foreign material during course of construction.

8.1.3. FIELD QUALITY CONTROL

8.1.3.1. Acceptance Tests:

In addition to the tests outlined below, perform all tests required per Part 8.10 of the ASME A17.1 Safety Code for Elevators and Escalators. All tests must be witnessed by a qualified elevator inspector (QEI).

1. Buffer Test: Test is not required for solid or spring type buffers. Test oil buffers in accordance with ASME code.
2. Normal Operation Test: Run car, in both up and down direction, by normal operation devices, with full load, stopping at each floor served, in both directions of travel.
3. Speed Test:
 - a. Determine actual speed of elevator car in both directions of travel with full load and no load in car.
 - b. Determine speed of car by use of tachometer.
 - c. Perform speed tests before and after normal operation tests.

4. Limit Switches: Test limit switches. (Car should not move).
5. Safety Tests:
 - a. Perform tests on all safety equipment to determine that they function properly. Tests are to be in accordance with the best practices of the trade.
 - b. Test car safety and governor in accordance with ASME Code.
 - c. File off any safety marks on guide rails after tests have been completed.
6. Static Load: Perform static load test to determine any movement of elevator car away from landing.
7. Pressure Relief: Test, set and seal pressure relief valve in accordance with ASME code.
8. Test all items of elevator to assure entire elevator system is operating properly.

8.1.3.2. Before safeties are reset check if:

1. Any part of the equipment has broken or is out of order.
2. Ropes are in respective sheave grooves.
3. The machine brake is applied.
4. Slack in hoisting ropes has been taken up (winding drum machines).
5. The governor jaws, and car releasing carrier, if any, have been reset to their normal running position.
6. The car platform is out of level more than that required by the ASME A17.1 Code.

8.1.3.3. Perform tests in presence of Consultant's Representative and QEI.

1. Sign completed ASME Elevator Test Report.

8.1.4 TECHNICAL SEMINAR/MAINTENANCE TRAINING

8.1.4.1. Upon completion of the Project, arrange with the Consultant's Representative to provide on the job training and seminar; a complete review of the documentation, operation and maintenance of the equipment and demonstration of any special features.

8.1.4.2. Minimum Seminar Length: One 2-hour seminar.

8.1.5 CLEANING

- 8.1.5.1. Clean elevator equipment of dust, dirt, grease and foreign materials.
- 8.1.5.2. Remove articles of tools and material from shafts and machine rooms not necessary for maintenance and operation of elevator.

8.2 DOOR OPERATION EXECUTION

8.2.1 INSTALLATION

- 8.2.1.1. Install door operators and integrate with elevator control equipment for required operation.
 - 1. Install electric power hoistway door operators at each opening, inside of shaft. If dual type operators are used, mount each operator one on each side of door, inside the shaft, rigidly supported.
 - 2. Install electric power gate operator on top of car, on rigidly framed supporting members.

8.2.2 FIELD QUALITY CONTROL

- 8.2.2.1. Inspect components for proper operation, ascertaining that operators and components are neatly and securely installed and aligned.
- 8.2.2.2. Tests: Demonstrate that door operators perform in accordance with required operation.
 - 1. Test door operators step by step as specified under function, and operation.

8.3 ELEVATOR CONTROL AND OPERATION EXECUTION

8.3.1 INSTALLATION

- 8.3.1.1. Install elevator controllers in the elevator machine room.
- 8.3.1.2. Install components and integrate with controllers for required operation of elevators.

8.3.2 FIELD QUALITY CONTROL

8.3.2.1. Inspection:

1. Power Off: Inspect control equipment for dirt, dust, grease or other foreign material that would prevent proper operation.
2. Power On:
 - a. Run elevator up and down shaft, stopping at each floor. Check for accurate landings and smooth stops and starts under all load conditions.
 - b. With elevator running, inspect control equipment for excessive arcing, heating of coils, misalignment of relays, contactors or switches.
 - c. Inspect motor generator for smooth operation (no excessive noise or vibration).

8.3.2.2. Tests:

1. Individually test each component for compliance with its specified function and operation.
2. Demonstrate that elevators perform in accordance with required type of operation.
 - a. Test elevators step by step as specified under function, and operation

8.4. ELEVATOR LANDING SIGNAL EQUIPMENT EXECUTION

8.4.1 INSTALLATION

8.4.1.1. General: Install elevator landing signal equipment and integrate with elevator control equipment for required operation.

8.4.1.2. Power Supply for Signal Equipment: Install in elevator or machine room.

8.4.1.3. Landing Fixtures: Install one riser of landing fixtures.

8.4.1.4. Landing Fixtures: Install 2 risers of landing fixtures. Locate one riser between elevator Nos. ___TBD___ and ___TBD___. Locate the other riser between elevators Nos. ___TBD___ and ___TBD___.

1. Hall Buttons: Flush mount hall buttons at each landing served by the elevators.

- a. Locate hall buttons with center line of buttons being 42 inches above finished floor.
 - b. Install single buttons at terminal landings. Install “Up” and “Down” buttons at intermediate landings.
2. Hall Lanterns:
 - a. Flush mount hall lanterns over each hoistway entrance door served by the elevator. At top terminal install “Down” lantern. At bottom terminal install “Up” lantern. At intermediate landings install both “Up” and “Down” lanterns.
 - b. Place hall lanterns as high as possible (no less than 72 inches from landing floor).
 3. Hall Position Indicators:
 - a. Flush mount hall position indicator over each entrance served by the elevator.
 4. Combination Hall Lantern and Position Indicator:
 - a. Flush mount combination hall lantern and position indicator over each entrance served by the elevator.

8.4.1.5. Lobby Display System:

1. Flush mount lobby display panel at designated floor.
 - a. Flush mount panel in wall between elevators.

8.5 ELEVATOR EMERGENCY OPERATION AND EMERGENCY SIGNAL DEVICES EXECUTION

8.5.1 INSTALLATION

8.5.1.1. Phase I and Phase II Operation:

1. Integrate components with elevator controller system for required operation.
2. The phase I key switch shall be located at the designated floor.

8.5.1.2. Emergency Light and Alarm System:

1. Recess emergency light fixture in operating panel of cab. Reinforce cutout in car panel for mounting of fixture.
2. Install wiring, relays, contacts as required to connect emergency light unit to 120 volt power source on car, and to inter-connect the six inch alarm bell on emergency light

unit with emergency call button and emergency stop button in car operating panel. In addition; provide interconnections to existing alarm bell located at the designated floor for each group of elevators.

3. Test battery capacity and recharge time. Operate one unit for required number of hours and load conditions.

8.5.1.3. Telephone Communication System:

1. Install the system in accordance with the Company's printed instructions.

8.5.1.4. Floor Numbers:

1. Paint minimum four inch high white gloss enamel numerals on the hoistway side of each hoistway door panel

8.5.1.5. Emergency Electric Service:

1. Mount strip switch for emergency power operation at the designated floor.
2. Integrate components with elevator controller system for required operation.

8.6 ELEVATOR WIRING EXECUTION

8.6.1 RACEWAY INSTALLATION

8.6.1.1. Raceway Types and Locations:

1. Install rigid ferrous metal conduit in all locations unless otherwise specified.
2. Flexible Metal Conduit:
 - a. Use for short runs to equipment such as interlocks, limit switches, hall buttons or items requiring adjustments (dry locations).
 - b. Use 1 to 2 feet of flexible metal conduit for final connection to equipment subject to vibration (dry locations).
3. Liquid tight Flexible Metal Conduit:
 - a. Use for short runs to equipment such as interlocks, limit switches, hall buttons or other items requiring adjustment (damp and wet locations).

- b. Use for 1 to 2 foot of liquid tight flexible metal conduit for final conduit connection to equipment subject to vibration (damp and wet locations).
4. Wire ways: May be installed in dry locations and not within 4 feet of elevator pit floor.

8.6.2 CONDUCTOR INSTALLATION

8.6.2.1. Install wiring in raceways. Exceptions:

1. Traveling cables connecting the car and hoistway wiring.
2. As permitted otherwise by the exceptions to National Electric Code Article 620-21.

8.6.2.2. Traveling Cables:

1. Terminate ends of traveling cables in NEMA 1 junction boxes equipped with labeled terminal strips and strain relief devices at both connections. Travel cable may be terminated on labeled terminal strips in control system cabinet.

8.6.3 OUTLET, JUNCTION AND PULLBOX INSTALLATION

8.6.3.1. Boxes For Concealed Conduit System:

1. Install boxes of depth to suit job conditions and also comply with Article 370 of the National Electrical Code.
2. Use galvanized steel boxes with flush covers for junction and pull boxes.

8.6.3.2. Boxes For Exposed Conduit System:

1. Use galvanized steel junction and pull boxes for Work in dry locations and damp locations.
2. Use threaded type boxes for all Work in wet locations and within 4 feet of elevator pit floor.

8.6.3.3. Specific Purpose Outlet Boxes:

Use specific purpose outlet boxes to mount equipment when available and suitable for job conditions.

8.6.4 SUPPORTING DEVICE INSTALLATION

8.6.4.1. Attachment of Conduit System:

1. Masonry Construction: Attach conduit to masonry construction by means of pipe straps or pipe clamps and masonry anchorage devices.
2. Steel Beams: Attach conduit to steel beams by means of "C" beam clamps and hangers.

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
1.0	<u>Preliminary & Conditions of Contracts</u>				
1.1	Allow for co-ordination of works with the Main Contractor and other Sub-contractors	1	Item		
1.2	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	1	Item		
1.3	To ensure the equipment are provided to specifications allow, allow for factory visit for Consultants to visit the manufacturing factory to verify the lift specifications and witness all the relevant factory tests before approval of shipping is given. Note that The Contractor shall allow for making the necessary arrangements; including the visa processing by arranging for invitation letters and any other necessary items required for this travel but excluding the Engineer's and Client's travel and subsistence expenses as they shall be catered for by the Client.				
1.4	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	1	Item		
1.5	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works.	1	Item		
1.6	Allow for on-site Training of the Operators	1	Item		
1.7	Allow for all the preliminaries relating to this contract as specified	1	Item		
1.8	Allow for all the preliminaries relating to this contract as specified	1	Item		
Total Carried to Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
2	<p>Panoramic Lift with the following data:</p> <p>Supply, Install and commission a Panoramic passenger lift manufactured to comply with EN81-20/50, EN81-70 with the following description:</p> <p>2.1 Capacity: 1600 Kg</p> <p>2.2 Speed: 2.00 m/s</p> <p>2.3 Control System: Full Collective</p> <p>2.4 Travel: 42m</p> <p>2.5 Counter Weight Safty Gear</p> <p>2.6 Shaft Size: 2600(w)x2200(d)</p> <p>2.7 Pit: 1500mm</p> <p>2.8 No. of floors: 11</p> <p>2.9 No. of Served floors: 11</p> <p>2.10 No of Landing Door: 11</p> <p>2.11 Car Entrance Type: Single</p> <p>2.12 Car Size: 2100(w)x1800(d)</p> <p>2.13 Door Type: 2 Panel Centre Opening</p> <p>2.14 Door Size: 1400(w)x2300(h)</p> <p>2.15 Car Finish: Champagne/Panoramic</p> <p>2.16 Car Door Finish: Champagne</p> <p>2.17 Landing Door Finish: Champagne</p> <p>2.18 Sill Material: Extruded Aluminium</p> <p>2.19 Signalization Display Type: LCD Display</p> <p>2.20 COP QTY: 2</p> <p>2.21 No. of Riser/Floor: 2</p> <p>2.22 Card Reader Provision</p> <p>2.23 CCTV Provision</p> <p>2.24 Intercom provision</p>	3	No		
Total Carried to the Next Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
	<p style="text-align: center;">Brought Forward From Previous Page</p> <p>Note</p> <p>The Lift should be Energy Efficient with Regenerative Drive, VVVF Variable voltage Variable frequency Motors, Efficient Lighting - LED indication and button Lighting, Sensor Controls- cabin lights and indicators are turned off when not in sleep mode. It should be padded</p> <p>Control options - Emergency light, fan in car, 2-way intercom, Telephone, Fire detection(Whole building doors open), fireman's drive, Elevator Announcer in English, lock with emergency drive, recessed overload signal & buzzer.</p> <p>Module for integration with BMS System</p>				
	Total Carried to Collection Page				-

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
3	<p>Passager Lift with the following data:</p> <p>Supply, Install and commission a passenger lift manufactured to comply with EN81-20/50, EN81-70 with the following description:</p> <p>3.1 Capacity: 1600 Kg</p> <p>3.2 Speed: 2.0 m/s</p> <p>3.3 Control System: Full Collective</p> <p>3.4 Travel: 42m</p> <p>3.5 Counter Weight Safty Gear</p> <p>3.6 Shaft Size: 2600(w)x2200(d)</p> <p>3.7 Pit: 1500mm</p> <p>3.8 No. of floors: 11</p> <p>3.9 No. of Served floors: 11</p> <p>3.10 No of Landing Door: 11</p> <p>3.11 Car Entrance Type: Single</p> <p>3.12 Car Size: 2100(w)x1800(d)</p> <p>3.13 Door Type: 2 Panel Centre Opening</p> <p>3.14 Door Size: 1400(w)x2300(h)</p> <p>3.15 Car Finish: Brushed Stainless Steel</p> <p>3.16 Car Door Finish: Brushed Stainless Steel</p> <p>3.17 Landing Door Finish: Brushed Stainless Steel</p> <p>3.18 Sill Material: Extruded Aluminium</p> <p>3.19 Signalization Display Type: LCD Display</p> <p>3.20 COP QTY: 2</p> <p>3.21 No. of Riser/Floor: 2</p> <p>3.22 Card Reader Provision</p> <p>3.23 CCTV Provision</p>	2	No		
Total Carried to the Next Page					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
	<p align="center">Brought Forward From Previous Page</p> <p>Notes:</p> <p>The Lift should be Energy Efficient with Regenerative Drive, VVVF Variable voltage Variable frequency Motors, Efficient Lighting - LED indication and button Lighting, Sensor Controls- cabin lights and indicators are turned off when not in sleep mode.</p> <p>Control options - Emergency light, fan in car, 2-way intercom, Telephone, Fire detection(Whole building doors open), fireman's drive, Elevator Announcer in English, lock with emergency drive, recessed overload signal & buzzer.</p> <p>Module for integration with BMS System</p> <p>Floor front facial Cabin location Indicator/ Sensor units</p> <p>Floor landing directional indicator buttons</p>				-
	Total Carried to Collection Page				-

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
4	<p>Service/Goods Lift with the following data:</p> <p>Supply, Install and commission a service/ goods lift manufactured to comply with EN81-20/50, EN81-70 with the following description:</p> <p>4.1 Capacity: 1600 Kg</p> <p>4.2 Speed: 1.5 m/s</p> <p>4.3 Control System: Full Collective</p> <p>4.4 Travel: 42m</p> <p>4.5 Counter Weight Safty Gear</p> <p>4.6 Shaft Size: 2300(w)x2700(d)</p> <p>4.7 Pit: 1500mm</p> <p>4.8 No. of floors: 11</p> <p>4.9 No. of Served floors: 11</p> <p>4.10 No of Landing Door: 11</p> <p>4.11 Car Entrance Type: Single</p> <p>4.12 Car Size: 1600(w)x2100(d)</p> <p>4.13 Door Type: 2 Panel Centre Opening</p> <p>4.14 Door Size: 1400(w)x2300(h)</p> <p>4.15 Car Finish: Brushed Stainless Steel</p> <p>4.16 Car Door Finish: Brushed Stainless Steel</p> <p>4.17 Landing Door Finish: Brushed Stainless Steel</p> <p>4.18 Sill Material: Extruded Aluminium</p> <p>4.19 Signalization Display Type: LCD Display</p> <p>4.20 COP QTY: 2</p> <p>4.21 No. of Riser/Floor: 2</p> <p>4.22 Card Reader Provision</p> <p>4.23 CCTV Provision</p> <p>Canvas for goods lift</p>	2	No		
Total Carried to the Next Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (Ksh)	AMOUNT (Ksh)
	<p style="text-align: center;">Brought Forward From Previous Page</p> <p>Notes:</p> <p>The Lift should be Energy Efficient with Regenerative Drive, VVVF Variable voltage Variable frequency Motors, Efficient Lighting - LED indication and button Lighting, Sensor Controls- cabin lights and indicators are turned off when not in sleep mode.</p> <p>Control options - Emergency light, fan in car, 2-way intercom, Telephone, Fire detection(Whole building doors open), fireman's drive, Elevator Announcer in English, lock with emergency drive, recessed overload signal & buzzer.</p> <p>Module for integration with BMS System</p> <p>Floor front facial Cabin location Indicator/ Sensor units</p> <p>Floor landing directional indicator buttons</p>				

Total Carried to Collection Page

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ITEM	DESCRIPTION	AMOUNT (Ksh)
1.0	Total for Preliminary & Conditions of Contracts B/F from BQ pg. 1	
2.0	Total for Panoramic Lift B/F from BQ pg. 3	
3.0	Total for Passenger Lift B/F from BQ pg. 5	
4.0	Total for Service/Goods Lift B/F from BQ pg. 7	
Total Carried Forward to form Tender		-

PART A
PARTICULAR SPECIFICATION AND CONDITIONS

PART A
PARTICULAR SPECIFICATION
CONDITIONS
INDEX

<u>Section</u>	<u>Description</u>	<u>Page No.</u>
1	Particular Conditions	A/1-A/2
2	Diesel Engine	A/3-A/6
3	Generator Set	A/7-A/11
4	Control Cubicle	A/12-A/18

SECTION 1

STANDBY GENERATOR

PARTICULAR CONDITIONS

1.1 Location of Site

The site of the proposed Sub-Contract work shall be situated at Nairobi, Kenya

The following climatic conditions apply at the site of the works and all plant, equipment, apparatus, materials and installation shall be suitable for these conditions.

Maximum temperature	-	30 ⁰ C
Minimum temperature	-	5 ⁰ C
Average temperature range	-	10 ⁰ C
Relative Humidity range	-	35% - 98%
Altitude	-	1700 metres above sea-level
Latitude	-	00 ⁰ 20'N
Longitude	-	32 ⁰ 36'E
Rainfall		Extremely heavy including thunderstorms at certain period of the year.

1.2 Description of Project

The project comprises the supply and installation of 3No. Standby Diesel Generating Set rated at 850kVA (at site) for proposed CPST Project.

1.3 Scope of Works

The scope of work comprises the supply, erection, assembly, wiring, connection, testing, commissioning and setting to work, 3No 850 kVA standby diesel generator, together with control panels in accordance with the Specification and Contract Drawings to provide a complete and operable installation. The generating set shall be provided with sound insulation to contribute no more than 70 decibels of noise (at 1 metre distance) to the surrounding.

1.4 Commencement of Works

The subcontractor, in submitting his tender shall be deemed to have included for commencing any necessary works on site at such time as will comply with the Main Contractor's programme.

1.5 Duration of Contract

The subcontractor shall be required to phase his work in accordance with the Main Contractor's programme (or its revision). The programme is to be agreed with the Electrical subcontractor. The subcontractor shall indicate the anticipated contract period in weeks.

1.6 Contract Drawings

The subcontractor shall be deemed to have studied all relevant Contract Drawings and to have allowed for any necessary provisions in his Sub-Contract Works required thereby.

1.7 Materials and Plant

The origin of all materials and plant on this project shall be declared by the Tenderer.

SECTION 2
DIESEL ENGINE

2.0 Cylinder Block

The cylinder block shall be made of one-piece cast iron. It shall have full-length water jacket with circulation around each cylinder. The cylinder block shall have wet liners with rubber seal at the bottom end.

2.1 Cylinder Head

The cylinder head for each bank of cylinders shall be of one piece and manufactured from cast iron. It shall be secured by studs of high tensile steel and be easily detachable. Valve seats shall be replaceable.

2.2 Pistons

The pistons shall be made of die cast aluminium alloy and tapered with a ground skirt. The pistons shall have at least three compression and two oil control rings. The combustion chamber and the valve recess shall be smooth contoured. The pistons shall have fully floating pins.

2.3 Valves

The valves shall have separate guides pressed into the cylinder head. Operating shall be of the normal pushrod/rocker type with tappet adjustment at the rocker arm.

2.4 Flywheel

The flywheel shall be of heavy cast iron with close coupling type cast iron flywheel housing and shall have a gear ring bolted onto it. The gear shall have heat treated teeth.

2.5 Crankshaft

The crankshaft shall be forged steel with induction hardened main and pin journals. It shall be statically and dynamically balanced and shall have replaceable, line steel bearings.

2.6 Connecting rods

The connecting rods shall be of 'I' Section forged steel.

2.7 Fuel and Air system

The engine shall have a mono-block injection pump which is gear driven through flexible coupling. The fuel pump shall be integral and shall incorporate a head primer. The engine shall have a multi-core injector nozzle. A fuel filter shall be provided complete with a replacement element and the engine shall have a heavy-duty oil bath air cleaner.

2.8 Governor

The governor shall be of the centrifugal type operating direct on the fuel line and shall be capable of maintaining the speed constant within 3% of nominal output in accordance with B.S.649 : 1958 Class A2.

2.9 Protection

The engine shall be provided with the following protective devices capable of providing audible and visible alarm signals at one or more remote locations:

- a) Low lubricating oil pressure
- b) High lubrication oil temperature
- c) High cooling water temperature
- d) High engine speed

2.10 Instrumentation

The engine shall be provided with the following instruments to indicate the various speeds and temperatures:

- i) Tachometer indicating the engine speed
- ii) Instrumentation to indicate the temperature of the exhaust gases.
- iii) Instrumentation to indicate the temperature of the lubrication oil.
- iv) Instrumentation to indicate the pressure of the lubrication oil
- v) Instrumentation to indicate the temperature of the cooling water.

2.11 Ancillary equipment

The subcontractor shall be responsible for providing the following ancillary equipment for the installation:

- a) Exhaust piping and heavy-duty silencer including flexible piping off the engine exhaust manifold. The exhaust piping provided shall be sufficiently long to cover the route shown on the Contract Drawings. The Contractor shall liaise with the building contractor for the final positioning of the exhaust pipe. The exhaust pipe shall be terminated in a duct 400 x 400mm internal dimension to the top of the building. Any additional silencers shall be provided to ensure the specified noise levels are maintained.
- b) Fuel storage tank of capacity 20,000 litres with contents gauge drainpipe with cock, vent, gill connection and engine supply with isolating valve. If the generator is supplied with an integral fuel tank, the additional tank shall be supplied to make up the specified capacity.
- c) Basic set of tools and special tools or gauges required for maintenance, all contained in a steel, lockable box. The tools may include but not limited to the following:
 - set of open-ended spanners
 - set of ring spanners
 - set of box spanners with tommy bar
 - circlip pliers (internal and external)
 - Normal pliers
 - Insulated crocodile pliers
 - set of insulated screwdrivers

- hammer
- valve spring compression tool
- piston band assembling set
- set of feeler gauges
- valve grinding tool
- cleaning outfit for injector nozzle

d) Semi-rotary hand pump to be mounted adjacent at the Ground Floor Level with necessary piping from pump to header tank.

2.12 Cooling system

Unless otherwise specified elsewhere, a suitable radiator shall be provided for the cooling water and lubricating oil requirements of the engine when operating under the site conditions stated. This shall be complete with engine driven fan and drive, guard for fan and drive, belt tensioner and all integral oil and water piping connections.

A suitable duct from the radiator face flange, extending to the ending room wall, total distance one metre, shall be supplied incorporating a flexible section if required.

Circulation of both lubricating oil and primary water shall be catered for by means of geared or belt driven pumps, integral with the engine.

A thermostatic bypass shall be fitted in the water outlet from the engine to give a quick warm up and even temperature control over the load range.

2.13 Lubrication

The engine components shall be lubricated via a pressure oil system from an integral oil pump driven by the engine. The system shall incorporate oil filters, the secondary oil filter being of the changeable type. A suitable relief valve shall be provided to maintain the pump discharge pressure within safe limits.

2.14 Starting

The engine shall start up by means of a D.C. motor, which shall be supplied, from a set of rechargeable batteries of an appropriate voltage and of such a capacity as to enable up to ten start-ups in one hour when fully charged.

2.15 Compliance

The equipment and installation shall comply with B.S.649 and also with C.P. 323.

The subcontractor shall in his statement of compliance confirm that the engine would be capable of running on class 'A' fuel to B.S.2869.

2.16 Noise level

The subcontractor shall state in his statement of compliance the level of noise in decibels expected in the engine room. The set shall be supplied complete with any necessary noise reduction cover to give a maximum noise level of 70 decibels at a distance of 10 metres from the generator building.

2.17 Ancillary Power requirements

In selecting the size of the diesel engine, the subcontractor shall make suitable allowances for power requirements for the cooling system, the lubricating system and any other requirements that may be necessary for that set.

2.18 Ventilation

The subcontractor must ensure that adequate ventilation in the generator room is provided.

2.18 Exhaust Fumes

The Sub-contractor shall provide piping to discharge exhaust fumes away from the building.

SECTION 3

GENERATOR SET

3.0 Alternator

The alternator shall be of 12 wire reconnectable brushless type rated at 0.8 p.f. lagging in accordance with B.S. 2613:1975 and having a revolving field, a single self-aligning roller bearing and solid half coupling to connect to the engine.

The alternator shall be screen protected, drip-proof and shall be wound high temperature, tropicalised class B insulation of the stator and class F insulation on the rotor. The stator frame shall be barrel design with conventional two layer winding in semi-enclosed skewed slots, pitched to give a good waveform with low harmonic content.

The rotor core shall be specially constructed with strip winding to obtain maximum cooling effect from the fabricated fan, with separate air circuits cooling the rotor and stator.

3.1 A.C. exciter

An A.C. exciter of direct - coupled flange mounted type shall be supplied. The exciter frame shall be of nodular iron and shall serve additionally as the bearing housing. The exciter armature shall be mounted on a tub on the alternator shaft. Connections shall be taken to the rotating rectifiers, which shall be carried on aluminium castings, from the main room.

3.2 Automatic Voltage Regulator

A Thyristor type static automatic voltage regulator shall be used to regulate machine. This regulator shall incorporate a zener diode bridge reference voltage circuit, thyristor drive reactor with series silicon diode and a further commutating diode. Under steady conditions, the automatic voltage regulator shall maintain the voltage within 3% for all balanced loads between no load and full load at power factors between unity and zero lagging. The automatic voltage regulator shall be complete with hand-operated manual control potentiometer which shall be fitted in control panel.

The voltage level controls shall enable the terminal voltage to be adjustable within the range - 5% to +10%.

The voltage gain controls shall be adjustable to compensate for engine speed variations when operating with a speed droop governor.

After any change of load, the voltage shall not vary by more than

- 15% the rated voltage, and shall return to within
- 3% within 3 seconds, and to within
- 2.5% rated voltage within 15 seconds. On starting, the voltage overshoot shall not exceed 15% and shall return to within 3% within 3 seconds.

3.3 Terminal box

Any suitable dimensioned terminal box suitable for conduit or cable entry shall be supplied with undrilled gland plate.

3.4 Rating

The machine shall be continuously maximum rated in accordance with B.S. 2613 and shall give the output specified in the particular specification. Allowance shall be made for a 10% overload for one hour in any 12 hours without any injurious overheating.

3.5 Engine rating

The engine driving the generator set shall be rated in accordance with B.S. 649:1958 and shall be so de-rated owing to site conditions that the specified electrical output is obtained from the alternator. The subcontractor shall provide additional labelling on the generator to distinguish clearly between the nameplate ratings and the actual ratings on site.

The tenderer's manufacturer's catalogue should indicate the percentage reductions from the nameplate ratings resulting from altitude and inlet temperature for any of the following engine variations:

- a) Naturally aspirated.
- b) Turbocharged without a charge air cooler.
- c) Turbo-charged with a charge air cooler.

3.6 Radio Interference suppression

The generator sets shall be suppressed for radio interference in accordance with B.S. 833 and C.P 1006.

3.7 Duty performance

The generator will be used as a standby duty generator.

3.8 Generator Set specification

The generator shall be sound attenuated (super silent) and shall be rated for the following parameters after suitable derating for the site service conditions and allowing for power requirements for integral cooling systems, lubricating system and any other integral parts of the set.

Generator output	850kVA (at site)
Rated power factor	0.8 lagging
Rated speed	1500 RPM
Frequency	50 Hz
Rated voltage	415/240V, 3 phase
Fuel Autonomy at Full load	9 Hours
Day Tank capacity	5 days at 12-hours utilization
Maximum Sound level	70dB(A)
Ambient temperature	up to 45 degrees C

The generator set shall also be provided with heavy-duty skid base fitted with anti-vibration mountings.

3.9 Testing and commissioning

The subcontractor shall include for fully commissioning the set and its control equipment, and for the purpose of the required tests, shall provide all necessary instruments, tools, fuel full tank and lubricating oil.

The tests and checks shall be carried out by the subcontractor in the presence of the Engineer or his representative, as applicable.

- i) Check that the main frame is level in all directions, engine and generator shafts are in proper alignment and the vibration absorbing devices are properly installed and located.
- ii) Check water and sump oil levels and that the water jacket is in working order.
- iii) Check the battery electrolyte levels and the specified gravity.
- iv) Ensure that sufficient oil is in the fuel tank for a two-hour test run.
- v) Examine the containers in which the fuel and lubricating oils were delivered and check that the type of oils are recommended for the unit.
- vi) Check that the engine block water drain points are free from sludge and other blockages.
- vii) Check engine bolts, main drive coupling, valve clearances, fuel pumps settings, governor settings, pipe line connections, water hose, exhaust couplings, flexible pipework etc. and the ball valve and overflow work.
- viii) Check all outgoing connections on the generator and at the control panel. All lugs for principal connections shall have clean and bright contact surfaces. A suitable abrasive material shall be used where necessary.
- ix) Check access panels and doors for proper opening and closing and for the functioning of any interlocks fitted.
- x) With the set isolated from the main supply and the selector switch in the 'Manual' position, start the engine by means of the 'start' push button and allow it to run up to normal speed. Check that during the time the engine starter motor is in operation, the mains battery charger is automatically switched off to avoid its being overloaded by the reduction in voltage across the battery.
- xi) Check instruments and gauges for normal operation and response and that the generator voltage is being maintained within the prescribed limits, making due allowance for no-load conditions. Compare the reading of the frequency meter with that of the engine tachometer.
- xii) Stop engine by turning selector switch to "off" position and verify that generator contactor opens at between 85% - 95% of normal voltage. Recheck water and oil levels.
- xiii) Turn selector switch to 'Auto' position. Disconnect the sending circuit supply and check that the set starts, the mains contactor opens, and the generator contactor

closes in correct order. Reconnect the sensing circuit to verify that the engine stops on restoration of the mains supply and that the contactors operate correctly. Check voltage sensing time delays on each phase in turn and also that the push buttons for mains failure simulation and engine stopping operate correctly.

N.B. *Running of the engine for any length of time under no-load conditions is undesirable and tests calling for such operation should be carried out in as short a time as is consistent with thoroughness.*

- xiv) Operate the necessary isolators and switches to put the set on standby for essential services network with the selector switch in the "Auto" position, and using the mains failure simulation push, verify that the set operates correctly with the appropriate time delay for taking up load and that the carrying of the load and its distribution over the three phases are satisfactory.
- xv) Run the set at various loads for periods totalling at least 30 minutes. Check the voltage and current in each phase in turn and that the voltage and frequency are being maintained within the required limits with large alterations of load.
- xvi) Check the operation of the turbocharger units and the colour of the exhaust gas at various loads.
- xvii) Check that the various engine safeguards operate satisfactorily.
- xviii) Check the vibration absorbing devices for proper operation and that the performance of all flexible connections, both mechanical and electrical, is satisfactory.
- xix) Recheck the lubricating oil and water level, replenish the fuel oil tank and leave the set in normal operating order.
- xx) An initial supply of all lubricating oils and greases shall be provided by the subcontractor.

SECTION 4

CONTROL CUBICLE

4.0 General

The control panel shall be totally enclosed type plant wall mounted in the generator room, fitted with removable covers giving access to the control gear, terminal and connection blocks and undrilled gland plates for cables entry and shall be finished in stove enameled grey hammer paint.

4.1 Function

The control cubicles shall house the start/stop buttons and protection systems and shall be complete with all the necessary relays and circuitry to the following requirements.

4.2 Control and Logic section

Facilities shall be available with suitable fuse protection for the following functions:

- a) Manual start
- b) Manual Stop
- c) Stall lockout, i.e. a lockout to prevent re-cranking of an engine upon fuel failure, or stall conditions.

4.3 Protection circuits

Suitably fused protection circuits, for oil, water, speed and one spare, shall be allowed for. The first stage protection shall be by means of fail-safe circuits, while the second stage shall be energised on fault circuits. All circuits except over-speed shall be commissioned after a delay following engine start-up.

The circuits for:-

- (a) Lubricating oil pressure.
- (b) Water temperature.
- (c) Spare.

shall be either alarm, or alarm and shutdown. The latter shall be achieved by means of a link within the control panel.

The circuit for engine over-speed shall give simultaneous alarm and shut down.

When the engine has a fault condition, the protection circuits shall still accept further faults. Once a shutdown signal has been given, the protection circuits shall be locked on as:

- (i) not to give further fault indication as engine stops.

(ii) to give indication of fault condition even when the engine has stopped.

The fault circuit shall be reset by pushing the "reset" button.

One audible alarm mute shall be provided for each fault channel. This shall mute the alarm for the fault causing the alarm, but shall leave the Klaxon prepared for further faults.

4.4 Switching section

A suitably fused switching section for engine functions as per list below shall be provided:

- Fuel rack solenoid (start or stop)
- Starter motor solenoid via a repeater

4.5 Indication

Indicator lamps as per list below shall be provided:

- (a) Engine running and protection circuits commissioned - green.
- (b) Fault parameters - all red.

The indication circuits shall have a lamp test pushbutton by means of which the lamp filaments can be tested.

4.6 Control switching

A rotary switch with off/on positions, to switch the control circuit supplies. In the 'ON' position the engine shall be started by depressing a push button and stopped by depressing a 'Stop' push button.

The indicators, switches and push buttons shall be mounted on the front face of the chassis unit

4.7 Alarm

The subcontractor shall supply and install a Klaxon which is loud enough to be heard even when the engine is running. The supply for this Klaxon shall be obtained from the control cubicle through suitably rated fuses.

4.8 Mains detection

A mains detection unit which can register a mains voltage failure under the following conditions shall be provided:

- (a) Failure of any one or more phases
- (b) Incorrect phase sequence
- (c) Low volts on any individual or all phases - i.e. below 85% of normal voltage.
- (d) Excessive frequency change i.e. +/- 3Hz

The failure condition shall be used to produce a start signal for the standby engine after a delay. The delay shall be adjustable and shall ensure the failure is not a transient condition.

Mains detection units shall receive their sensing supplied from the main board feeding the load.

4.9 Instrumentation and controls

The following equipment shall be provided by the Generator supplier:

- (a) Moulded case air circuit breaker, triple pole and neutral, with magnetic release to provide alternator short circuit protection, trip free handle and shunt trip.
- (b) One bolted neutral link.
- (c) Alternator voltage trimmer regulator.
- (d) 3No., one per phase, flush mounting ammeters.
- (e) 1 No., flush mounting voltmeter.
- (f) 1 No., voltmeter rotary selector switch.
- (g) One set of control circuit instruments and the accompanying fuses.
- (h) All internal wiring, terminals, cable lugs, legends and one main earthing bar.
- (i) 1 No., frequency meter, vibrating leaf type.
- (j) 1 No., governor motor raise and lower switch.
- (k) Cable boxes and glands to suit.
- (l) 1 No. Kilowatt-hour meter.

4.10 Terminations

All internal wiring terminations shall be numbered and marked with ferrules.

4.11 Earthing

The subcontractor shall be responsible for ensuring that the earthing of the generator neutral is carried out efficiently and that the resistance of the generator neutral from the earth does not exceed one ohm.

Earth pit provision has been given under builder's works for the installation of an earth mat but the subcontractor shall be responsible for the supply and installation of an earth mat comprising of 1000mm x 1000mm mesh of 25mm x 3mm copper tape.

The earth rods shall be 2m long by 15mm diameter, extensible type as "copperweld" or other equal and approved, each pair of electrodes shall be located not less than 3m apart, the first pair being not less than 3m from the building.

The copper earth mat shall be laid in 1200mm x 1200mm x 800mm deep earth the

surface of the pit with a concrete inspection cover.

The subcontractor shall ensure that the earthing system of the generator is adequately bonded to the permanent earth system of the 'normal' supply.

All earthing shall be carried out in accordance with the appropriate section of the I.E.E. Regulations.

4.12 Trickle charger

The trickle charger shall have rating and service parameters such as to keep the engine start batteries fully charged and ready for service whenever required. When the engine is running the batteries shall be charged from integral dynamo.

4.13 Hours counter

The subcontractor shall allow for the installation of an hours counter on the control panel for the generator.

4.14 Automatic Changeover Contactor unit

(a) A contactor unit shall be provided in the main switchroom. On failure of the normal electricity supply the change-over panel will automatically initiate the starting of and effect the transfer of load to the standby generator. The unit shall contain power contactors and ancillary apparatus as specified.

A control cable shall be laid between the changeover panel and the generator control panel in the new generator room.

(b) Failure of normal supply shall mean complete loss of voltage or the falling below 85% of the normal voltage between any two phases or phase and neutral.

(c) The power circuit shall consist of two contactors feeding a common busbar to which the load will be directly connected. One contactor shall control the normal supply, the other standby supply; they shall be electrically and mechanically interlocked so that they cannot both be closed at the same time.

(d) On failure of the normal supply, the unit shall operate in the following manner:

(i) After a delay, adjustable from 0 to 5 seconds (to avoid operation by a transient dip in voltage) a signal shall be given to start the standby generating set.

(ii) On receipt of a signal from the standby generating set that it is ready to take the load and providing that the failure of the normal supply still persists, the normal supply contactor shall close. If the normal supply still persists, the normal supply contactor shall close. If the normal supply has been restored before the changeover has taken place, the contactors shall not operate and the starting delay contacts shall open to initiate the shutting down of the standby generating set.

- (e) When the standby supply is in operation and the normal supply is restored and remains within 10% of rated voltage on all phases for a preset time (adjustable to 30 seconds) the standby contactor shall open and the contacts shall then open to shut down the standby generating set.

Provision should be so made that automatic return to normal supply can be prevented if required.

Once a start signal has been sent to the standby generating set, the engine starting sequence shall be allowed to continue until the set is ready to take the load before a stopping signal is sent.

By addition of external connections the following facilities shall be available:

Remote starting of the standby generating set and transfer of the load to it.

Restoration of the normal supply on failure of the standby generating set.

Each switch shall be labelled with its duty and each position shall be marked.

The following switches shall be fitted:

Contactor control switch, with make before break contacts and 'Hand' and 'Auto' positions. In the 'Hand' position the unit shall be controlled the "Contactor Hand Control Switch". In the "Auto" position the unit shall operate automatically irrespective of the position of the "Contactor Hand Control Switch".

A contactor Hand Control Switch: with 'Standby' and 'Normal' position.

An Auto Return Switch; having 'ON' and 'OFF' positions. In the 'ON' position the return to normal supply shall be automatic when the normal supply is restored.

Contactor by-pass switches: shall be provided to enable the essential load circuits to be served direct from the normal supply to enable the generator and/or the control equipment to be serviced. The by-pass switches shall be provided with a suitable and conspicuous label warning against leaving the generator in the disconnected position.

Indicating lamps shall be provided. They shall be appropriately labelled, easily visible and shall give the following information:

Normal supply available.

Standby supply available.

Normal supply in use.

Standby supply in use.

A push button labelled 'Test' shall be provided to enable a failure of normal supply to be simulated. If the button is pressed and released the equipment shall complete the starting sequence and when the set is ready to take the load it shall be shut down. If the button is held depressed the equipment shall change over to the standby supply when the set is ready to take load.

The control circuit supply shall be either 12 volts or 24 volts D.C. depending upon the starting battery and charger.

No current shall be drawn from the control supply when the unit is accepting the normal power supply.

1.3.00 SUB-CONTRACT SUM AND VARIATIONS

Sub-Contract Sum

1.3.01 The sub-contract sum shall comprise:-

- a) A price for imported materials delivered to site, less import duty and VAT.
- b) A price for import duty and value added tax on imported materials
- c) A price for materials purchased locally and delivered to site.
- d) A price for all labour in Kenya.
- e) A price for all other costs necessary for the execution and completion of the Sub-Contract Works.

The price of imported materials shall be necessary for the execution duration of the Sub-Contract Agreement with a provision for foreign variation adjustment.

The price for value added tax (VAT) and import duty shall be an estimate and shall be included in the Sub-Contract Sum as provisional sums from which payment will be made for the actual VAT and import duty paid directly to Government by the Sub-Contractor for materials imported for incorporation in the Sub-Contract Works for which receipt shall be produced before payment is certified by the Engineer.

The price of materials purchased locally shall be a fixed price for the duration of the Sub-contract Agreement.

The price for all other costs necessary for the execution and completion of the Sub-Contract Works shall be a fixed price for the duration of the sub-contract Agreement. It will be deemed that the sub-contractor provided in the sub-Contract Sum for all costs that may be incurred in the execution and completion of the sub-Contract Works in compliance with all parts and clauses of the Specification and the Sub-Contract Agreement and for any increase in the cost of materials during the currency of the Sub-contract Agreement. Any claims for errors or omissions when preparing the tender for the Sub-Contract Works or for increased costs other than labour price fluctuations and exchange rate variations will not be entertained.

1.3.02 Labour Price Fluctuations

a) Definitions

Valuation Period - shall be the calendar period in which the labour being valued was executed.

Base Month - shall be the calendar month prior to that in which the tender was returned. The rates of the base month are deemed to equate to the price level

represented by labour price proportion of the Sub-Contract Works during the valuation period.

1.3.03 Payment of Fluctuation Adjustment

The conditions applicable to the Main Contract shall apply.

1.3.06 Payment for Materials

Payment will be made for materials available for installation either delivered to or stored on site. If payment is requested for materials stored off-site the following conditions shall be met by the Sub-Contractor:

- a) The materials shall become the property of the Employer and shall be suitably labelled to indicate the ownership of the materials.
- b) The replacement value of the materials shall be covered by insurance taken out as in the Sub-Contract Agreement.
- c) The defects liability period for the materials shall commence on the date of the practical completion of the main contract works, provided that the Sub-Contract Works are practically complete.
- d) The cost of storage and of transportation to site will be deemed to have been included in the price for materials shown in the Schedule of Prices.
- e) The Sub-Contractor shall have stated in his tender his intention to store materials off site.
- f) The materials shall be housed in secure and weather-proof premises to the approval of the Engineer.

Amounts certified will be paid to the Sub-Contractor through the main Contractor. Retention amounting to 10% of the labour cost will be withheld, but no retention will be held on the cost of materials. To cover this, the Sub-Contractor shall provide a performance bond of 20% of the total Sub-Contract value.

1.4.00 Appendix to the Sub-Contract Agreement

The completion periods of the Sub-Contract Works to be inserted in the appendix in accordance with the Sub-Contract Agreement will be tied to the main contract completion dates and the Contractor's Construction Program.

1.5.00 Nominated Sub-contractors and Nominated Suppliers

The full intent and spirit of conditions relating to the Main Contract Agreement shall apply to the Sub-Contract Agreement and for the purpose of this application the terms "Contractor" and "Bills of Quantities" where they appear in these conditions shall be construed to mean "Sub-Contractor" and "Price Schedules" respectively.

1.6.00 Signing for Materials Supplied

The Sub-Contractor shall be required to sign a receipt for all the materials and articles supplied by the Employer at the time of taking delivery thereof, as having received them in good order and condition and will thereafter be responsible for any loss or damage and for replacement of any such loss or damage with materials at his own cost and expense to the satisfaction of the Engineer.

1.7.00 Trade Names

Where trade names of manufacturers' catalogue numbers are mentioned in the Specification, the reference is intended as a guide to the type of article and quality of material requirement. The sub-Contractor may use any article of materials equal in type and quality of those described in the Specification subject to the prior approval of the Engineer and at the Engineer's absolute discretion. The onus of proof as to the equivalent quality will rest with the Sub-Contractor who will be deemed to have provided in the Sub-Contract Sum for the article or material described in the Specification.

1.8.00 Casing up and Protecting

The Sub-Contractor shall be responsible for advising the Contractor, in writing, of the need for casing up or protecting to the satisfaction of the Engineer all parts of the Sub-Contract Works liable to damage.

1.9.00 Sub-Contractor's Superintendence

The Sub-Contractor shall constantly keep on the site a literate Agent or Representative competent and experienced in the kind of work involved who shall give his whole time to the Superintendence of the Sub-Contract Works. Such Agent or Representative shall receive on behalf of the Sub-Contractor directions and instructions, which shall be deemed to have been given to the Sub-Contractor in accordance with the Conditions of the Sub-Contract Agreement.

The Sub-Contract Works shall be executed under the direction and to the entire satisfaction in all respects of the Contractor and Engineer who shall at all times during the normal working hours have access to the Sub-Contract Works and to the yard and workshop of the Sub-Contractor and subsidiary Sub-Contractors or other places where work is being prepared for the Sub-Contract Works.

The working hours shall be those generally worked by the good employers in the Building and Civil Engineering Trades in Kenya. No work shall be carried out at night or on gazetted holidays unless the Contractor shall so direct.

No work shall be covered up nor any concreting be carried out in the absence of the Clerk of Works or the site Resident Engineer without the prior approval of the Engineer.

1.10.00 Administrative Procedures and Contractual Responsibility

Wherever within the Specification it is mentioned or implied that the Sub-Contractor shall deal direct with the Employer or Engineer or Architect, it shall mean "through

the Contractor" who is responsible to the Employer for the whole of the project works including that part of the works which is the subject to this Sub-Contract.

1.11.00 Work included in the Sub-Contract

It will be deemed that the Sub-Contractor allowed in the Sub-Contract Sum everything necessary for the proper execution and completion of the Sub-Contract Works according to the true intent and meaning of the Contract Drawings and the Specification taken together and to the approval of the Engineer. It will be deemed that the Sub-Contractor took cognizance of and complied with this requirement when preparing his tender for the execution and completion of the Sub-Contract Works. Any claim based upon qualifications included in any documents which accompanied the Sub-Contractor's tender will not be entertained.

The onus for discovering any differences that may exist between the Contract Drawings and the text of the Specifications will be taken to rest with the Sub-Contractor and it will be deemed that any such differences have been found and clarification sought by the Sub-Contractor and afforded to him by the Engineer prior to the Sub-Contractor submitting his tender for the execution and completion of the Sub-Contract works.

Should any differences be found between the Contract Drawings and the text of the Specification after the submission of the tender, the Engineer will, at his absolute discretion and without prejudice to the Employer, decide the procedure to be followed.

It will be deemed that the Sub-Contractor prior to submitting his tender for the execution and completion of the Sub-Contract Works obtained all particulars, information, explanation and clarifications from all appropriate sources, including the Engineer, necessary for the complete and correct preparation of the tender. Any claim based upon want of knowledge in any respect of the Sub-Contract Works will not be entertained.

1.12.00 Structural Provision for the Works

The preliminary major structural provision has been made for the Sub-Contract Works based on the outline information ascertained during the preparation of the Specification.

The preliminary major structural provision made will be deemed as adequate unless the Sub-Contractor stated otherwise when submitting his tender.

Any minor structural provision or alteration to the major structural provisions required by the Sub-Contractor shall be shown on the working drawings to be submitted to the Engineer before commencement of the Work by the Contractor.

No requests for alterations to the preliminary major structural provisions will be approved except where they are considered unavoidable by the Engineer. In no case will they be approved if the building works is so far advanced as to cause additional costs or delays in the work of the Contractor.

1.13.00 Positions of Services, Plant, Equipment, Fittings and Apparatus

The Contract Drawings give general indication of the intended layout. The positions of the equipment and appliances, and also the exact routes of the ducts, mains, and distribution pipework shall be confirmed before installation is commenced. The exact sitting of the appliances, pipework etc. might vary from that indicated.

The routes of the services and the position of the apparatus shall be determined by the approved dimensional details on the working drawings or on site by the Engineer in consultation with the Sub-Contractor or the Contractor.

Services through ducts shall be arranged to allow maximum access along the ducts and the services shall be readily accessible for maintenance. Any work which has to be re-done due to negligence in this respect shall be the Sub-Contractor's responsibility.

The Sub-Contractor shall be deemed to have provided in his Sub-Contract Sum for locating terminal points of the services (e.g. push buttons, indicators, control switches, and other initiating devices) in positions plus or minus 1.5m horizontally and vertically from the locations shown on the Contract Drawings. Within these limits no variations in the Sub-Contract Sum will be made unless the work has already been executed in accordance with previously approved working drawings and with the approval of the Engineer.

1.14.00 Installation Liaison

The Sub-Contractor shall liaise with the Engineer and the Contractor in planning the Sub-Contract Works before work is commenced. Particular care shall be taken by the Sub-Contractor to ensure there is a close liaison with the other Sub-Contractors in installing services to prevent fouling of services positions, cable routes, switch positions, access positions etc. Any work which has to be re-done due to negligence in this respect shall be the Sub-Contractor's responsibility.

Where large items of equipment such as switchboards, plant and machinery, tanks, cylinders or duct work or long lengths of tube are to be installed, or cable has to be flaked out before drawing in, the Sub-Contractor shall advise the Contractor in good time so that the access and other facilities are provided for installation before work is commenced on site.

1.15.00 Checking of Works

The Sub-Contractor shall satisfy himself as to the correctness of the connections he makes to all items of the equipment supplied under the Sub-Contract Agreement and equipment supplied under any other contract before it is put into operation. Details of operation, working pressures, temperatures, voltages, phase, power rating etc. shall be confirmed to others carrying out work on or associated with the system and confirmation received before the system is installed.

1.16.00 Setting to Work and Regulating System

The Sub-Contractor shall carry out such tests of the Sub-Contract Works as required by the British Standard Specification, British Standards Codes of Practice, the IEE Regulations or equal and approved Codes as specified hereinafter.

No testing of commissioning shall be undertaken except in presence of and to the satisfaction of the Engineer unless approved otherwise by him (Sub-Contractor's preliminary and proving tests excepted).

The Sub-Contractor shall submit to the Engineer, for approval, a suitable program for testing and commissioning.

The Engineer and the Employer shall be given ample warning in writing to the dates on which testing and commissioning will take place.

The Sub-Contractor shall commission the Sub-Contract Works and provide attendance during the commissioning of all services, plant and apparatus connected under the Sub-Contract Agreement.

Each system shall be properly balanced, graded and regulated to ensure that correct operation is achieved.

The proving of any system or plant or equipment as to compliance with the Specification shall not be approved by the Engineer except at his discretion, until tests have been carried out under operating conditions pertaining to the most onerous conditions specified except where the time taken to obtain such conditions is unreasonable or exceeds 12 months after practical completion of the Sub-Contract Works.

Prior to shipment, the Sub-contractor shall arrange for Factory inspection by the Engineer, at the Sub-contractor's expense.

1.17.00 Identification of the Plant and Components

The Sub-Contractor shall supply and fix identification labels to all items of the machinery and control equipment. Care shall be taken to ensure that the labels can be read without difficulty. This requirement shall apply also to major components and items of the control equipment which are contained within equipment cubicles or plant. The labelling shall be indelible.

1.18.00 Contract Drawings

The Contract Drawings when read in conjunction with the Specification text have been completed in such detail as was considered necessary to enable competitive tenders to be obtained for the execution and completion of Sub-Contract Work.

The Contract Drawings are not intended to be working drawings and shall not be used as such.

1.19.00 Working Drawings

The Sub-Contractor shall prepare such working drawings as may be necessary. The Working Drawings shall be complete in such details not only that the Sub-Contract

Works can be executed on site but also that the Engineer can approve the Sub-Contractor's proposals, detailed designs and intention in the executions of the Sub-Contract Works.

If the Sub-Contractor requires any further instructions, details, Contract Drawings or information drawings to enable him to prepare his working drawings or proposals, the Sub-Contractor shall apply in writing to the Engineer for such information at a time which is neither unreasonably distant from nor unreasonably close to the date when it is needed.

All working drawings shall be submitted to the Engineer for approval. If not so submitted the Sub-Contractor shall accept at his own cost, the risk that any work commenced or which he intends to commence at site may be rejected.

The Engineer in giving his approval to the working drawings will presume that any necessary action has been taken or shall be taken by the Sub-Contractor to ensure that the installations shown on the working drawings have been cleared through the Contractor with any other Sub-Contractor whose installations and works might be affected.

If the Sub-Contractor submits his working drawings to the Engineer without first liaising and obtaining clearance for his installations from the Contractor, then he shall be liable to pay for any alteration or modification to his own. The Contractor's or other Sub-Contractor's installations and works, which are incurred, notwithstanding any technical or other approval which the Sub-Contractor's working drawings may have received from the Engineer.

Working drawings to be prepared by the Sub-Contractor shall include but not restricted to the following:-

- a) Any drawing required by the Contractor or the Engineer to enable structural provision to be made including builder's work Drawing or Schedules and those for the detailing of holes, chases, fixings, foundations, cables and pipework ducting whether below or above ground or in or outside or below buildings.
- b) General Arrangement drawings of all plant, control boards fittings and apparatus or any part thereof and of installation layout arrangement of such plant and apparatus.
- c) Schematic layout drawings of services and of control equipment.
- d) Layout drawings of all embedded and non-embedded pipework, ducts, and electrical conducts.
- e) Complete circuit drawings of the equipment together with associated circuit description.
- f) Such other drawings as are called for in the text of the Specification or schedules or as the Engineer may reasonably require.

Three copies of all working drawings shall be submitted to the Engineer for approval. One copy of the working drawings submitted to the Engineer for approval will be returned to the Sub-Contractor stamped as follows:-

<p>EXAMINED AND RETURNED FOR CORRECTION</p> <p>Date..... Signature.....</p>

<p>APPROVED IN PRINCIPLE WITH CORRECTIONS INDICATED.</p> <p>Date..... Signature.....</p>
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<p>APPROVED IN PRINCIPLE</p> <p>Date..... Signature.....</p>
--

<p>Approval of Contractor's Drawings or document shall not relieve the Contractor or any of his obligations.</p>
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Six copies of approved working drawings shall be given to the Contractor by the Sub-Contractor for information and distribution to other Sub-Contractors carrying out work associated with, in close proximity to or which might be affected by the Sub-Contract Works.

Approved working drawings shall not be departed from except as may be approved or directly by the Engineer.

Approval by the Engineer of the work drawings shall neither relieve the Sub-Contractor of any of his obligations under the Sub-Contract Agreement nor relieve him from correcting any errors found subsequently in the Approved Working Drawings or other working drawings and in the Sub-Contract Works on site or elsewhere associated therewith.

The Sub-Contractor shall ensure that the working drawings are submitted to the Engineer for approval at a time not unreasonably close to the date when such approval is required. Late submission of his working drawings will not relieve the Sub-Contractor of his obligation to complete the Sub-Contract Works within the agreed Contract Period and in a manner that would receive the approval of the Engineer.

1.20.00 Record Drawings (as installed) and Instructions

During the execution of the Sub-Contract Works the Sub-Contractor shall, in a manner approved by the Engineer, record on working or other Record drawings at site all information necessary for preparing Record Drawings of the installed Sub-Contract Works. Marked up working or other drawings and other documents shall be made available to the Engineer as he may require for inspections and checking.

Record Drawings may, subject to the approval of the Engineer, include approved working drawings adjusted as necessary and certified by the Sub-Contractor as correct record of the installation of the Sub-Contract Works.

They shall include but not restricted to the following information or drawings:-

- a) Working Drawings amended as necessary but titled "Record Drawings" and certified as true record of the "as installed" Sub-Contract Works. Subject to the approval of the Engineer such working drawings as may be inappropriate may be omitted.
- b) Fully dimensioned drawings of all plant and apparatus.
- c) General arrangement drawings of equipment, other areas containing plant forming part of the Sub-Contract Works, indicating the accurate size and location of plant and apparatus suitable cross-referenced to the drawings mentioned in (b) above and hereinafter.
- d) Routes, types, sizes and arrangement of all electric cables, conduits, ducts and wiring including the dates of installation of buried works.
- e) System schematic diagrams showing all salient information relating to the control and instrumentation.
- f) Wiring and piping diagrams of plant and apparatus.
- g) Schematic diagram of individual plant, apparatus, and switch and control boards. These diagrams should include those peculiar to individual plant or apparatus and also those applicable to system operation as a whole.
- h) Operating instructions.

- i) Schematic and wiring diagrams shall not be manufacturer's multipurpose general issue drawings. They shall be prepared specially for the Sub-Contract Works and shall contain no spurious or irrelevant information.

Two copies of the Record Drawings of the Sub-Contract Works and Schematics shall be provided not later than one month after the date of the practical completion.

Record Drawings shall be on approved linen or plastic material.

Notwithstanding the Sub-Contractor's obligations referred to above, if the Sub Contractor fails to produce, to Engineer's approval either

- i. The marked up drawings during executions of the Sub-Contract Works, or
- ii. The Record Drawings

Within one month of practical completion, the Engineer will have these drawings produced by others. The cost of obtaining the necessary information and preparation of such drawings will be deducted from payments due to the Sub-Contractor.

1.21.00 Hand Over

The Sub-Contract Works shall be considered complete and the defects liability period shall commence only when the Sub-Contract Works and supporting services have been tested, commissioned and operated to the satisfaction of the Engineer and officially approved and accepted by the Employer, provided always that the handing over of the Sub-Contract Works shall be coincident with the handing over of the Main Contract Works.

The procedure to be followed will be as follows:-

- a) On the completion of the Sub-Contract Works to the satisfaction of the Engineer and the Employer, the Sub-Contractor shall request the Engineer to arrange the Hand Over.
- b) The Engineer shall arrange a handover meeting or a series thereof at site.
- c) The Sub-Contractor shall arrange with the Engineer and the Employer for a complete demonstration of each and every service to be carried out and for the instruction to be given to the relevant operation staff and other representatives of the Employer.
- d) The Sub-Contractor shall prepare approved Hand Over Certificates and a full list of all control and items of equipment, tools, spares and the like.
- e) In the presence of the Employer and Engineer, Hand Over will take place, subject to agreement of the Hand Over Certificates and associated check lists.

1.22.00 Painting

It will be deemed that the Sub-Contractor provided for all protective and finish painting in the Sub-contract Sum for the Sub-Contract Works. Any special requirements are described elsewhere in the Specification.

1.23.00 Guarantee and Liability for Defects in Materials and Workmanship

Any defects which shall appear within the "Defects Liability Period" stated in the Appendix to the Conditions annexed to the Main Contract Agreement and which shall be due to materials or workmanship causes occurring before the completion of the Sub-Contract Works shall within a reasonable time after receipt of the Engineer's Written instructions be made good by the Sub-Contractor (unless the Engineer shall otherwise direct in writing) at his own cost.

1.24.00 Construction Programme and overtime

The Sub-Contractor will be deemed to have discussed the construction programme for the Main Contract with the Contractor or, if not appointed, with the Architect and Quantity Surveyor before submitting his tender for the execution and completion of the Sub-Contract Works.

The Sub-Contractor's tender will be deemed to have been prepared with the full knowledge of the aforementioned construction programme and to include for all Sub-Contractor's costs necessary to enable the Sub-Contract Works to be executed without causing any delay in the Main Contract Works.

The Sub-Contractor shall be responsible to the Contractor for any cost incurred by the Contractor due to delays in the main Contract Works caused by the Sub-Contractor.

The Sub-Contractor will be deemed to have included in his tender for any overtime necessary to execute the Sub-Contract Works such that delays are not caused in the Main Contract Works.

1.25.00 Testing and Inspection - Manufactured Plant

The Engineer reserves the right to inspect and test or witness tests of all plant, equipment and materials at the manufacturer's works. The right of the Engineer relating to inspection, examination and testing of plant at the manufacturer's works shall be applicable to insure companies and inspection authorities so nominated by the Engineer.

The Sub-Contractor shall give two weeks' notice to the Engineer of his intention to carry out any inspection or tests and the Engineer or his representatives shall be entitled to witness such tests and inspections.

Six copies of all test certificates and performance curves shall be submitted as soon as possible after the completion of such tests to the Engineer for his approval.

The plant or equipment which is shipped before the relevant test certificate has been approved by the Engineer shall be shipped at the Sub-Contractor's own risk and should the test certificate not be approved new tests may be ordered at the Sub-Contractor's expense.

The foregoing provisions relate to tests at manufacturer's works and as appropriate to those carried out at site.

1.25.00 Test at Factory

The Sub- Contractor shall note that the Engineer and the Client may require witness of tests and inspections of locally and/or overseas manufactured equipment during construction at the manufacturer's works. The Sub-Contractor shall allow for making the necessary arrangements; including the visa processing by arranging for invitation letters and any other necessary items required for this travel but excluding the Engineer's and Client's travel and subsistence expenses as they shall be catered for by the Client.

1.26.00 Local Agents

The Sub-Contractor shall ensure that the manufacturers of any plant, apparatus or equipment which he includes in the Sub-Contract Works have appointed Agents in Kenya, who have undertaken to stock adequate spare and to provide, if required, a comprehensive maintenance service.

Any plant, apparatus, or equipment installed by the Sub-Contractor in execution of the Sub-Contract Works to which it is subsequently discovered that there is no appointed manufacturer Agent in the country, or for which there is no maintenance service available locally or adequate spare parts held in Kenya shall be removed and replaced with plant, apparatus or equipment of the Engineer's choosing at the Sub-Contractor's own cost.

1.27.00 Insurance

No payment in account of the Sub-Contract Works executed will be made to the Sub-Contractor until he has satisfied the Engineer either by production of an insurance policy or an insurance certificate that the requirements of insurance have been complied with in all respects.

1.28.00 Attendance on Sub-Contractor

The Contractor will provide General Attendance as defined in the Standard Method of Measurement of Building Works and special attendance as follows:-

"Allow use standing scaffolding, messrooms sanitary, accommodation and welfare facilities, provide space for office accommodation and space for storage of plant and materials, provide light and water for their work, clear away rubbish, unload, provide facilities for storage, hoist, provide water and power, remove and replace dust covers, pipe casing and the like for execution and testing of the Sub-Contractor's Works and being responsible for the accuracy of the same".

The Sub-Contractor shall be responsible for providing his own lock-up shed and stores.

1.29.00 Government Acts Regarding Work People

The Sub-Contractor shall comply with all Government Acts, Orders and Regulations in connection with the employment of labour and other matters related to the execution of the Sub-Contract Works. In particular the Sub-Contractor's attention is drawn to the provisions of the Factory Act 1972 and it shall be deemed that his tender included for all costs arising or resulting from compliance with any Act, Order or Regulation relating to Insurance, Pensions and Holidays for Work People or to the Safety, health or Welfare of Work People.

The Sub-Contractor shall make himself fully acquainted with the Current Acts and Regulations including Police Regulations regarding the movement, housing, security and control of labour, camps, passes for transport etc. It shall be deemed that the Sub-Contractor before tendering obtained from the relevant authorities the fullest information regarding all such regulations and/or restrictions which may affect the organisation of the Sub-Contract Works and to have allowed accordingly in the tender. No claim in respect of want of information or knowledge in this connection will be entertained.

1.30.00 Initial Maintenance

The Sub-Contractor shall make routine maintenance inspection once a month during the liability for the Defects Period and shall carry out all necessary adjustments and repairs, cleaning and oiling of moving parts.

A monthly report of the inspection and any work done upon the lifts shall be supplied to the Engineer.

The Sub-Contractor shall also provide a 24-hours breakdown service to attend to faults on or malfunctioning of the lift installation between the routine visits of inspection.

The Sub-Contractor shall allow in the Sub-Contract Sum for the initial maintenance, inspection and breakdown service and shall provide for all tools, instruments, plant and scaffolding and the transportation thereof, as required for the correct and full execution of these obligations and the provision, use or installation of all materials as oils, greases, sandpaper, etc. or parts which are periodically renewed such as brake linings etc. or parts which are faulty for any reason whatsoever excepting always Act of God such as storm, tempest, flood, earthquake and civil revolt, acts of war and vandalism.

1.31.00 Maintenance and Servicing After Completion of the Initial Maintenance

The Sub-Contractor shall, if required, enter into a maintenance and service agreement with the Employer for the lift installation for a period of up to five years from the day

following the last day of the Liability for Defects Period which offers the same facilities as specified in clause 1.30.00 (Initial Maintenance) above.

The terms of any such agreement shall not be less beneficial to the Employer than the terms of agreements for other similar installations in Nairobi.

The Sub-Contractor shall submit with his tender for the Works, a firm quotation for the maintenance and service of the lift installation as specified herein, which shall be based upon the present day costs and may be varied only to take into account increases in material and labour unit rate costs between the time of tendering and the signing of the formal maintenance and service agreement and which shall remain valid and open for acceptance by the Employer up to and including the last day of the Fifth complete calendar month following the end of the Liability for Defects Period.

2.0.00 GENERAL SPECIFICATION

2.1.00 GENERAL

The Sub-Contractor shall fully comply with the requirements and recommendation of the following:-

- (a) The Electric Power Act and the Rules made thereunder.
- (b) Energy Regulatory Commission regulations.
- (c) The Kenya Power and Lighting Company Limited's by-laws.
- (d) The current edition of the Regulations for the Electrical Equipment of Building issued by the Institution of Electrical Engineers of Great Britain and any Kenya Bureau of Standards' amendments thereto except where compliance with these regulations would cause contravention of the requirements and recommendations of item (a), (b) and (c) above.
- (e) British Standard Code of Practice, C.P. 407.1972 on Electric, Hydraulic and Hand powered lifts issued by the British Standards Institution on behalf of the Council of Codes of Practice, and all British Standard Specifications recommended by that code of practice.
- (f) British Standard Code of Practice 2655 Parts 1, 2, 3, 6, 7, 9 and 10 issued by the British Standard Institution.
- (g) The requirements of the Chief Inspector of Factories for the Government of Kenya.

2.2.00 Builder's Works

All chasing, cutting away and making good will be done by the Contractor. The Sub-Contractor shall be responsible for making out in advance and for ensuring that the Builder's work has been carried out accurately and in accordance with the Sub-Contractor's requirements.

The Sub-Contractor shall drill and plug holes in the floors, walls, ceilings and roofs for securing services and equipment requiring screw or bolt fixing purpose. Fixing brackets shall not constitute Builder's work and shall be provided and installed by the Sub-Contractor.

2.3.00 Landing Door Key

It shall be possible to open every landing door by use of secret key whether or not the lift is in the landing zone. The key hole shall be unobtrusive and located at high level.

2.4.00 Painting

All parts of the control equipment, switch gear, trunking, bed plates and closed section of metal works parts which will not be accessible for painting after erection shall be given three coats of paints at the manufacturer's works.

All bright services shall be coated with lacquer or other protective coating before leaving the manufacturer's works.

Metal work in the lift shaft shall be painted on site with three coats of best quality oil paint.

2.5.00 Tests and Examination

Tests and examination of the entire lift installation and all incorporated equipment and materials shall be carried out in accordance with all the requirements of BS 2655 Part 7, 1970.

2.6.00 Interference Suppression

Lift motors associated control equipment shall be suppressed so as not to interfere with local radio and television reception or local radio paging and closed circuit television systems or electro-medical equipment within the building. Suppression shall be carried out in accordance with B.S. 800 and all suppression devices incorporated shall comply with B.S. 613.

2.7.00 Wall Switches

All operating switches in the lift shaft shall be of the totally enclosed drip-proof type.

2.8.00 Protective Pads

The Sub-Contractor shall supply one set of protective quilted over pads to approval for each size of passenger lift car specified.

2.9.00 Manual Operation

Provision shall be made for manual operation of lifts and lowering of the lifts by means of spokeless wheel. This shall be mounted on the drive motor. The Sub-Contractor shall provide a brake release key and landing door emergency key which shall be supplied and fixed by the Sub-Contractor.

2.10.00 Base Frame

The complete hoisting equipment shall be mounted on a frame of fabricated steel which when stalled shall be insulated from the building structure by means of rubber or other approved sound and vibration isolating material provided and fixed in an approved manner between the base frame and supporting beams.

2.11.00 Work by others

The following provision shall be made by others free of charge to the Sub-Contractor:-

- (a) Floor ducts.
- (b) All builder's work such as cutting away and making good.
- (c) Enclosure work, concrete floors, concrete foundations, etc.
- (d) Provision and maintenance of temporary lighting and power supplies for tools and testing of lift equipment.
- (e) Permanent power and lighting supplies to generator rooms .
- (f) Provision of clear access to working areas.
- (g) Painting of the lift wells and motor rooms with two coats of white emulsion paint.

DIESEL ENGINE

2.0 Cylinder Block

The cylinder block shall be made of one-piece cast iron. It shall have full-length water jacket with circulation around each cylinder. The cylinder block shall have wet liners with rubber seal at the bottom end.

2.1 Cylinder Head

The cylinder head for each bank of cylinders shall be of one piece and manufactured from cast iron. It shall be secured by studs of high tensile steel and be easily detachable. Valve seats shall be replaceable.

2.2 Pistons

The pistons shall be made of die cast aluminium alloy and tapered with a ground skirt. The pistons shall have at least three compression and two oil control rings. The combustion chamber and the valve recess shall be smooth contoured. The pistons shall have fully floating pins.

2.3 Valves

The valves shall have separate guides pressed into the cylinder head. Operating shall be of the normal pushrod/rocker type with tappet adjustment at the rocker arm.

2.4 Flywheel

The flywheel shall be of heavy cast iron with close coupling type cast iron flywheel housing and shall have a gear ring bolted onto it. The gear shall have heat treated teeth.

2.5 Crankshaft

The crankshaft shall be forged steel with induction hardened main and pin journals. It shall be statically and dynamically balanced and shall have replaceable, line steel bearings.

2.6 Connecting rods

The connecting rods shall be of 'I' Section forged steel.

2.7 Fuel and Air system

The engine shall have a mono-block injection pump which is gear driven through flexible coupling. The fuel pump shall be integral and shall incorporate a head primer. The engine shall have a multi-core injector nozzle. A fuel filter shall be provided complete with a replacement element and the engine shall have a heavy-duty oil bath air cleaner.

2.8 Governor

The governor shall be of the centrifugal type operating direct on the fuel line and shall be capable of maintaining the speed constant within 3% of nominal output in accordance with B.S.649 : 1958 Class A2.

2.9 Protection

The engine shall be provided with the following protective devices capable of providing audible and visible alarm signals at one or more remote locations:

- a) Low lubricating oil pressure
- b) High lubrication oil temperature
- c) High cooling water temperature
- d) High engine speed

2.10 Instrumentation

The engine shall be provided with the following instruments to indicate the various speeds and temperatures:

- i) Tachometer indicating the engine speed
- ii) Instrumentation to indicate the temperature of the exhaust gases.
- iii) Instrumentation to indicate the temperature of the lubrication oil.
- iv) Instrumentation to indicate the pressure of the lubrication oil
- v) Instrumentation to indicate the temperature of the cooling water.

2.11 Ancillary equipment

The subcontractor shall be responsible for providing the following ancillary equipment for the installation:

- a) Exhaust piping and heavy-duty silencer including flexible piping off the engine exhaust manifold. The exhaust piping provided shall be sufficiently long to cover the route shown on the Contract Drawings. The Contractor shall liaise with the building contractor for the final positioning of the exhaust pipe. The exhaust pipe shall be terminated in a duct 400 x 400mm internal dimension to the top of the building. Any additional silencers shall be provided to ensure the specified noise levels are maintained.
- b) Fuel storage tank of capacity 20,000 litres with contents gauge drainpipe with cock, vent, gill connection and engine supply with isolating valve. If the generator is supplied with an integral fuel tank, the additional tank shall be supplied to make up the specified capacity.
- c) Basic set of tools and special tools or gauges required for maintenance, all contained in a steel, lockable box. The tools may include but not limited to the following:
 - set of open-ended spanners
 - set of ring spanners
 - set of box spanners with tommy bar
 - circlip pliers (internal and external)
 - Normal pliers
 - Insulated crocodile pliers
 - set of insulated screwdrivers
 - hammer

- valve spring compression tool
- piston band assembling set
- set of feeler gauges
- valve grinding tool
- cleaning outfit for injector nozzle

d) Semi-rotary hand pump to be mounted adjacent at the Ground Floor Level with necessary piping from pump to header tank.

2.12 Cooling system

Unless otherwise specified elsewhere, a suitable radiator shall be provided for the cooling water and lubricating oil requirements of the engine when operating under the site conditions stated. This shall be complete with engine driven fan and drive, guard for fan and drive, belt tensioner and all integral oil and water piping connections.

A suitable duct from the radiator face flange, extending to the ending room wall, total distance one metre, shall be supplied incorporating a flexible section if required.

Circulation of both lubricating oil and primary water shall be catered for by means of geared or belt driven pumps, integral with the engine.

A thermostatic bypass shall be fitted in the water outlet from the engine to give a quick warm up and even temperature control over the load range.

2.13 Lubrication

The engine components shall be lubricated via a pressure oil system from an integral oil pump driven by the engine. The system shall incorporate oil filters, the secondary oil filter being of the changeable type. A suitable relief valve shall be provided to maintain the pump discharge pressure within safe limits.

2.14 Starting

The engine shall start up by means of a D.C. motor, which shall be supplied, from a set of rechargeable batteries of an appropriate voltage and of such a capacity as to enable up to ten start-ups in one hour when fully charged.

2.15 Compliance

The equipment and installation shall comply with B.S.649 and also with C.P. 323.

The subcontractor shall in his statement of compliance confirm that the engine would be capable of running on class 'A' fuel to B.S.2869.

2.16 Noise level

The subcontractor shall state in his statement of compliance the level of noise in decibels expected in the engine room. The set shall be supplied complete with any necessary noise reduction cover to give a maximum noise level of 70 decibels at a distance of 10 metres from the generator building.

2.17 Ancillary Power requirements

In selecting the size of the diesel engine, the subcontractor shall make suitable allowances

for power requirements for the cooling system, the lubricating system and any other requirements that may be necessary for that set.

2.18 Ventilation

The subcontractor must ensure that adequate ventilation in the generator room is provided.

2.19 Exhaust Fumes

The Sub-contractor shall provide piping to discharge exhaust fumes away from the building.

GENERATOR SET

3.0 Alternator

The alternator shall be of 12 wire reconnectable brushless type rated at 0.8 p.f. lagging in accordance with B.S. 2613:1975 and having a revolving field, a single self aligning roller bearing and solid half coupling to connect to the engine.

The alternator shall be screen protected, drip-proof and shall be wound high temperature, tropicalised class B insulation of the stator and class F insulation on the rotor. The stator frame shall be barrel design with conventional two layer winding in semi-enclosed skewed slots, pitched to give a good waveform with low harmonic content.

The rotor core shall be specially constructed with strip winding to obtain maximum cooling effect from the fabricated fan, with separate air circuits cooling the rotor and stator.

3.1 A.C. exciter

An A.C. exciter of direct - coupled flange mounted type shall be supplied. The exciter frame shall be of nodular iron and shall serve additionally as the bearing housing. The exciter armature shall be mounted on a tub on the alternator shaft. Connections shall be taken to the rotating rectifiers, which shall be carried on aluminium castings, from the main room.

3.2 Automatic Voltage Regulator

A Thyristor type static automatic voltage regulator shall be used to regulate machine. This regulator shall incorporate a zener diode bridge reference voltage circuit, thyristor drive reactor with series silicon diode and a further commutating diode. Under steady conditions, the automatic voltage regulator shall maintain the voltage within 3% for all balanced loads between no load and full load at power factors between unity and zero lagging. The automatic voltage regulator shall be complete with hand-operated manual control potentiometer which shall be fitted in control panel.

The voltage level controls shall enable the terminal voltage to be adjustable within the range - 5% to +10%.

The voltage gain controls shall be adjustable to compensate for engine speed variations when operating with a speed droop governor.

After any change of load, the voltage shall not vary by more than

15% the rated voltage, and shall return to within

3% within 3 seconds, and to within

2.5% rated voltage within 15 seconds. On starting, the voltage overshoot shall not exceed 15% and shall return to within 3% within 3 seconds.

3.3 Terminal box

Any suitable dimensioned terminal box suitable for conduit or cable entry shall be supplied with undrilled gland plate.

3.4 Rating

The machine shall be continuously maximum rated in accordance with B.S. 2613 and shall give the output specified in the particular specification. Allowance shall be made for a 10% overload for one hour in any 12 hours without any injurious overheating.

3.5 Engine rating

The engine driving the generator set shall be rated in accordance with B.S. 649:1958 and shall be so derated owing to site conditions that the specified electrical output is obtained from the alternator. The subcontractor shall provide additional labelling on the generator to distinguish clearly between the nameplate ratings and the actual ratings on site.

The tenderer's manufacturer's catalogue should indicate the percentage reductions from the nameplate ratings resulting from altitude and inlet temperature for any of the following engine variations:

- b) Naturally aspirated.
- b) Turbocharged without a charge air cooler.
- c) Turbo-charged with a charge air cooler.

3.9 Radio Interference suppression

The generator sets shall be suppressed for radio interference in accordance with B.S. 833 and C.P 1006.

3.10 Duty performance

The generator will be used as a standby duty generator.

3.11 Generator Set specification

The generator shall be sound attenuated (super silent) and shall be rated for the following parameters after suitable derating for the site service conditions and allowing for power requirements for integral cooling systems, lubricating system and any other integral parts of the set.

Generator output	850kVA (at site)
Rated power factor	0.8 lagging
Rated speed	1500 RPM
Frequency	50 Hz
Rated voltage	415/240V, 3 phase
Fuel Autonomy at Full load	9 Hours
Day Tank capacity	5 days at 12-hours utilization
Maximum Sound level	70dB(A)
Ambient temperature	up to 45 degrees C

The generator set shall also be provided with heavy-duty skid base fitted with anti-vibration mountings.

3.9 Testing and commissioning

The subcontractor shall include for fully commissioning the set and its control equipment, and for the purpose of the required tests, shall provide all necessary instruments, tools, fuel full tank and lubricating oil.

The tests and checks shall be carried out by the subcontractor in the presence of the

Engineer or his representative, as applicable.

- i) Check that the main frame is level in all directions, engine and generator shafts are in proper alignment and the vibration absorbing devices are properly installed and located.
- ii) Check water and sump oil levels and that the water jacket is in working order.
- iii) Check the battery electrolyte levels and the specified gravity.
- iv) Ensure that sufficient oil is in the fuel tank for a two-hour test run.
- v) Examine the containers in which the fuel and lubricating oils were delivered and check that the type of oils are recommended for the unit.
- vi) Check that the engine block water drain points are free from sludge and other blockages.
- vii) Check engine bolts, main drive coupling, valve clearances, fuel pumps settings, governor settings, pipe line connections, water hose, exhaust couplings, flexible pipework etc. and the ball valve and overflow work.
- viii) Check all outgoing connections on the generator and at the control panel. All lugs for principal connections shall have clean and bright contact surfaces. A suitable abrasive material shall be used where necessary.
- ix) Check access panels and doors for proper opening and closing and for the functioning of any interlocks fitted.
- x) With the set isolated from the main supply and the selector switch in the 'Manual' position, start the engine by means of the 'start' push button and allow it to run up to normal speed. Check that during the time the engine starter motor is in operation, the mains battery charger is automatically switched off to avoid its being overloaded by the reduction in voltage across the battery.
- xi) Check instruments and gauges for normal operation and response and that the generator voltage is being maintained within the prescribed limits, making due allowance for no-load conditions. Compare the reading of the frequency meter with that of the engine tachometer.
- xii) Stop engine by turning selector switch to "off" position and verify that generator contactor opens at between 85% - 95% of normal voltage. Recheck water and oil levels.
- xiii) Turn selector switch to 'Auto' position. Disconnect the sensing circuit supply and check that the set starts, the mains contactor opens, and the generator contactor closes in correct order. Reconnect the sensing circuit to verify that the engine stops on restoration of the mains supply and that the contactors operate correctly. Check voltage sensing time delays on each phase in turn and also that the push buttons for mains failure simulation and engine stopping operate correctly.

N.B. *Running of the engine for any length of time under no-load conditions is undesirable and tests calling for such operation should be carried out in as short a time as is consistent with thoroughness.*

- xiv) Operate the necessary isolators and switches to put the set on standby for essential services network with the selector switch in the `Auto" position, and using the mains failure simulation push, verify that the set operates correctly with the appropriate time delay for taking up load and that the carrying of the load and its distribution over the three phases are satisfactory.
- xv) Run the set at various loads for periods totalling at least 30 minutes. Check the voltage and current in each phase in turn and that the voltage and frequency are being maintained within the required limits with large alterations of load.
- xvi) Check the operation of the turbocharger units and the colour of the exhaust gas at various loads.
- xviii) Check that the various engine safeguards operate satisfactorily.
- xviii) Check the vibration absorbing devices for proper operation and that the performance of all flexible connections, both mechanical and electrical, is satisfactory.
- xix) Recheck the lubricating oil and water level, replenish the fuel oil tank and leave the set in normal operating order.
- xxi) An initial supply of all lubricating oils and greases shall be provided by the subcontractor.

CONTROL CUBICLE

4.0 General

The control panel shall be totally enclosed type plant wall mounted in the generator room, fitted with removable covers giving access to the control gear, terminal and connection blocks and undrilled gland plates for cables entry and shall be finished in stove enameled grey hammer paint.

4.1 Function

The control cubicles shall house the start/stop buttons and protection systems and shall be complete with all the necessary relays and circuitry to the following requirements.

4.2 Control and Logic section

Facilities shall be available with suitable fuse protection for the following functions:

- a) Manual start
- b) Manual Stop
- c) Stall lockout, i.e. a lockout to prevent rekranking of an engine upon fuel failure, or stall conditions.

4.3 Protection circuits

Suitably fused protection circuits, for oil, water, speed and one spare, shall be allowed for. The first stage protection shall be by means of fail-safe circuits, while the second stage shall be energised on fault circuits. All circuits except overspeed shall be commissioned after a delay following engine startup.

The circuits for:-

- (d) Lubricating oil pressure.
- (e) Water temperature.
- (f) Spare.

shall be either alarm, or alarm and shutdown. The latter shall be achieved by means of a link within the control panel.

The circuit for engine overspeed shall give simultaneous alarm and shut down.

When the engine has a fault condition, the protection circuits shall still accept further faults. Once a shutdown signal has been given, the protection circuits shall be locked on as:

- (i) not to give further fault indication as engine stops.
- (ii) to give indication of fault condition even when the engine has stopped.

The fault circuit shall be reset by pushing the "reset" button.

One audible alarm mute shall be provided for each fault channel. This shall mute the alarm for the fault causing the alarm, but shall leave the Klaxon prepared for further faults.

4.4 Switching section

A suitably fused switching section for engine functions as per list below shall be provided:

- Fuel rack solenoid (start or stop)
- Starter motor solenoid via a repeater

4.5 Indication

Indicator lamps as per list below shall be provided:

(a) Engine running and protection circuits commissioned - green.

(b) Fault parameters - all red.

The indication circuits shall have a lamp test pushbutton by means of which the lamp filaments can be tested.

4.6 Control switching

A rotary switch with off/on positions, to switch the control circuit supplies. In the 'ON' position the engine shall be started by depressing a push button and stopped by depressing a 'Stop' push button.

The indicators, switches and push buttons shall be mounted on the front face of the chassis unit

4.7 Alarm

The subcontractor shall supply and install a Klaxon which is loud enough to be heard even when the engine is running. The supply for this Klaxon shall be obtained from the control cubicle through suitably rated fuses.

4.8 Mains detection

A mains detection unit which can register a mains voltage failure under the following conditions shall be provided:

(e) Failure of any one or more phases

(f) Incorrect phase sequence

(g) Low volts on any individual or all phases - i.e. below 85% of normal voltage.

(h) Excessive frequency change i.e. +/- 3Hz

The failure condition shall be used to produce a start signal for the standby engine after a delay. The delay shall be adjustable and shall ensure the failure is not a transient condition.

Mains detection units shall receive their sensing supplied from the busbars feeding the load.

4.9 Instrumentation and controls

The following equipment shall be provided by the Generator supplier:

(a) Moulded case air circuit breaker, triple pole and neutral, with magnetic release to provide alternator short circuit protection, trip free handle and shunt trip.

(b) One bolted neutral link.

(c) Alternator voltage trimmer regulator.

(d) 3No., one per phase, flush mounting ammeters.

(e) 1 No., flush mounting voltmeter.

(f) 1 No., voltmeter rotary selector switch.

(g) One set of control circuit instruments and the accompanying fuses.

(h) All internal wiring, terminals, cable lugs, legends and one main earthing bar.

(i) 1 No., frequency meter, vibrating leaf type.

(j) 1 No., governor motor raise and lower switch.

(k) Cable boxes and glands to suit.

(l) 1 No. Kilowatt-hour meter.

4.10 Terminations

All internal wiring terminations shall be numbered and marked with ferrules.

4.11 Earthing

The subcontractor shall be responsible for ensuring that the earthing of the generator neutral is carried out efficiently and that the resistance of the generator neutral from the earth does not exceed one ohm.

Earth pit provision has been given under builder's works for the installation of an earth mat but the subcontractor shall be responsible for the supply and installation of an earth rod 2m long by 15mm diameter, extensible type as "copperweld" or other equal and approved, each pair of electrodes shall be located not less than 3m apart, the first pair being not less than 3m from the building.

The subcontractor shall ensure that the earthing system of the generator is adequately bonded to the permanent earth system of the 'normal' supply.

All earthing shall be carried out in accordance with the appropriate section of the I.E.E. or KEBS Regulations.

4.12 Trickle charger

The trickle charger shall have rating and service parameters such as to keep the engine start batteries fully charged and ready for service whenever required. When the engine is running the batteries shall be charged from integral dynamo.

4.13 Hours counter

The subcontractor shall allow for the installation of an hours counter on the control panel for the generator.

4.14 Automatic Changeover Contactor unit

(a) A contactor unit shall be provided in the main switch-room. On failure of the normal electricity supply the change-over panel will automatically initiate the starting of and effect the transfer of load to the standby generator. The unit shall contain power contactors and ancillary apparatus as specified.

A control cable shall be laid between the changeover panel and the generator control panel in the new generator room.

(b) Failure of normal supply shall mean complete loss of voltage or the falling below 85% of the normal voltage between any two phases or phase and neutral.

(c) The power circuit shall consist of two contactors feeding a common busbar to which the load will be directly connected. One contactor shall control the normal supply, the other standby supply; they shall be electrically and mechanically interlocked so that they cannot both be closed at the same time.

(d) On failure of the normal supply, the unit shall operate in the following manner:

- (i) After a delay, adjustable from 0 to 5 seconds (to avoid operation by a transient dip in voltage) a signal shall be given to start the standby generating set.
- (ii) On receipt of a signal from the standby generating set that it is ready to take the load and providing that the failure of the normal supply still persists, the normal supply contactor shall close. If the normal supply still persists, the normal supply contactor shall close. If the normal supply has been restored before the changeover has taken place, the contactors shall not operate and the starting delay contacts shall open to initiate the shutting down of the standby generating set.
- (e) When the standby supply is in operation and the normal supply is restored and remains within 10% of rated voltage on all phases for a preset time (adjustable to 30 seconds) the standby contactor shall open and the contacts shall then open to shut down the standby generating set.

Provision should be so made that automatic return to normal supply can be prevented if required.

Once a start signal has been sent to the standby generating set, the engine starting sequence shall be allowed to continue until the set is ready to take the load before a stopping signal is sent.

By addition of external connections the following facilities shall be available:

- Remote starting of the standby generating set and transfer of the load to it.
- Restoration of the normal supply on failure of the standby generating set.

Each switch shall be labelled with its duty and each position shall be marked. The following switches shall be fitted:

- Contactor control switch, with make before break contacts and 'Hand' and 'Auto' positions. In the 'Hand' position the unit shall be controlled the "Contactor Hand Control Switch". In the "Auto" position the unit shall operate automatically irrespective of the position of the "Contactor Hand Control Switch".
- A contactor Hand Control Switch: with 'Standby' and 'Normal' position.
- An Auto Return Switch; having 'ON' and 'OFF' positions. In the 'ON' position the return to normal supply shall be automatic when the normal supply is restored.
- Contactor by-pass switches: shall be provided to enable the essential load circuits to be served direct from the normal supply to enable the generator and/or the control equipment to be serviced. The by-pass switches shall be provided with a suitable and conspicuous label warning against leaving the generator in the disconnected position.

Indicating lamps shall be provided. They shall be appropriately labelled, easily visible and shall give the following information:

- Normal supply available.
- Standby supply available.
- Normal supply in use.
- Standby supply in use.

A push button labelled 'Test' shall be provided to enable a failure of normal supply to be simulated. If the button is pressed and released the equipment shall complete the starting sequence and when the set is ready to take the load it shall be shut down. If the button is held depressed the equipment shall change over to the standby supply when the set is ready to take load.

The control circuit supply shall be either 12 volts or 24 volts D.C. depending upon the starting battery and charger.

No current shall be drawn from the control supply when the unit is accepting the normal power supply.

STANDBY GENERATOR BILLS OF QUANTITIES

SCHEDULE NO. 1.1
STANDBY GENERATOR INSTALLATION
PRICE SUMMARY

Item	Details	Price (KSh.)
1.	Sub-Contract Preliminaries.	
2.	Supply and installation of set of 3No. 850 KVA generator sound attenuated type set complete with control panel. (Share datasheets)	
3.	Supply and installation of synchronizing panel and local cabling.	
4.	VAT and Customs Duty on imported items	
5.	Commissioning of set	
6.	Supply of "AS FITTED" drawings and maintenance.	
7.	Schedule No. 4 - Supply of tool kit	
8.	Schedule No. 5 - Supply of spares and lubricants.	
9.	Schedule No. 6 - Fuel Storage tanks	
10.	Schedule No. 7 - Earthing	
11.	Schedule No. 8 - Provisional Sums and Contingencies	
12.	Any other item to complete installation (if nil, write nil)	
TOTAL		

In words

.....

Exchange Rate:

Signed (as in tender)

.....

For and behalf of

Date:

SCHEDULE NO. 1.2

SUMMARY OF INFORMATION FOR TENDERER

The Tenderer is advised to read the relevant section of the Specifications for full details of the items summarised below:

Item	Requirements	Ref. clause
1.	Operating conditions	
	Site	1.2
	Altitude m, above sea level
	Temperature range°C
	Relative humidity% - 90%
	Range to operate in	Unheated building
	Dust conditions	Dust laden atmosphere
2.	Duty	Mains failure unit and standby power 3.7
		10 starts per hour 2.14
3.	Performance	850kVA 415 volts, 3 phase 50 Hz 3.8
4.	Set arrangements	
	Weather proof roof and side panels	not required
5.	<u>Remote governor control</u>	not required 2.8
6.	Aspiration	Natural or turbo-charged 3.5
<u>7.</u>	Manual start	required
8.	Sump heater	not required
9.	Silencer: _	required, details of additional pipe work and fittings if required 2.11 (a)
10.	Daily service tank:	
		...20,000 litres... capacity if other than 24 hours
		..12..... hours/24 hours 2.11 (b)
		Transfer pump/ hand pump ... 2.11 (d)
11.	Auxiliary fuel tank:	
	Siting	not required
	Capacity

Schedule No. 1.2 (contd.)

PROPOSED CPST DEVELOPMENT

Item	Requirements	Ref. clause
12.	Fuel Jettisons cock for (a) Daily service tank (b) Auxiliary fuel tank	required
13.	Engine instruments: details if not as standard	2.10
14.	Cooling system	required 2.12
15.	Electrical control panel: mains switch Provision for parallel running Kilowatt - hour meter	circuit breaker required required 4.9
16.	Lockout remote indication circuit	required 4.2
17.	Fire service terminals	required
18.	Earth fields	required
19.	Building drawing	required
20.	Maintenance period	12 months

SCHEDULE NO. 1.3

TECHNICAL DETAILS OF THE SET OFFERED BY TENDERER

Item	Details
1. <u>Diesel Engine</u>	
Make	_____
Type	_____
Bore	_____ mm
Stroke	_____ mm
Net continuous rating (B.S. 649)	
(a) at sea level	_____ kVA
(b) site	_____ kVA
Speed	_____ rev/min
Year this type put into service	_____
Total number sold	
(a) Worldwide	_____
(b) in East Africa	_____
(c) in Kenya	_____
Supercharger:	
Make	_____
Type	_____
Number in use	_____
Thermometers:	
Make	_____
Type	_____
Pyrometers:	
Make	_____
Type	_____

SCHEDULE No. 1.3 (Cont'd)

Item	Details
Air cooling:	
Quantity of air required	_____ cu.m/sec
Details of ducting	_____
Water cooling:	
details of water cooling circuits`	_____

PROPOSED CPST DEVELOPMENT

Radiator:

Make

Type

Length

mm

Bread

mm

Height

mm

Aspiration:

Method

Quantity of air required

m³/sec

Noise Level

dBA at 10 m

SCHEDULE No. 1.3 (Cont'd)

ITEM		DETAILS		
2.	Auxiliaries	Make	Type	Other Relevant Details
	Lubricating oil circuits			
	Filters			
	Coolers			
	Primary pumps			
	Tachometer and drive			
	Governor			
	Cold start devices			
	Running hours meter			
	Safety devices:			
	High temperature			
	Low pressure (lubricating oil)			
	Cooling water flow trip			
	Over speed trip			
	Speed sensing devices			
	Lubricating oil thermometers:			
	Number			
	position (s)			
	Water thermometer:			
	Starting Battery			
	Immersion heater			

SCHEDULE No. 1.3 (Cont'd)

3.	Lubrication		
	Recommended oil (s)	Grade	Quantity (litres)
	Sump		
	Elsewhere (state where)		

4. **Alternator and Exciter**

Make and Type _____

Bearings * ball/roller/plain

Insulation Class (BC.2757) _____

* Delete as necessary

SCHEDULE No. 1.3 (Cont'd)

ITEM	DETAILS		
	Make	Type	Rating
5.	Electrical Control Panel		

Main circuits breaker		Amps	

Bypass switches			

		Amps	

Changeover contactor		Amps	

Automatic voltage regulator	_____		
Control switches	_____		
Control fuse - No.....*		Amps	

Relays		Amps	

Indicator lamps - No.....*		Volts	Watts

Ammeter switch	_____		
Voltmeter switch	_____		
KWh meter	_____		
Frequency meter	_____		
Ammeters - No.....*		Amps	

Voltmeters - No.....*		Volts	

Power factor meter	_____		
Other equipment - give Details	_____		

SCHEDULE No. 1.3 (Cont'd)

6. Performance data

Fuel Consumption	<i><u>Rated Output -</u></i> %	Consumption kg/kWh
	110	
	100	
	75	
	50	
Maximum output	<u>Ambient Temp. (°C)</u>	<u>Out-put (kVA)</u>
	40	
	30	
	20	
	10	

SCHEDULE No. 1.3 (Cont'd)

6. Performance data

	Item	Details
	Critical speed - rev/min.	_____
	Cyclic irregularity	_____ % _____
	Voltage regulation	_____ % _____
	Frequency regulation	_____
	Time to accept 75% full load from 5°C	_____ Seconds _____
	Time to accept 100% full load from 5°C	_____ Seconds _____
7.	<u>Physical Details</u>	
	Daily service tank for 24 hour operation - capacity	_____ Litres _____
	Size mm long mm wide mm high
	Total weight of set	_____
	Overall dimension of set	_____
	Weight of Heaviest component	_____ kg _____
	Weather proofing	_____

SCHEDULE No. 1.3 (Cont'd)

8.	Operational Details	
	Description of Operation	
	Details of drawings, literature etc, included with the tender	
9.	Delivery Details	
	Time in weeks from acceptance of tender to delivery of all equipment to site	_____
	Time in weeks from acceptance of tender to commissioning tests	_____ Weeks
10.	Noise level in engine room	_____ decibels

SCHEDULE NO. 1.4

DEVIATION FROM THE SPECIFICATION

The tenderer shall give below details of any equipment which does not meet the specification, or any other deviations, omissions, additions or alternatives in respect of the set which he is offering.

If none, write none.

SCHEDULE NO. 1.5

LIST OF TOOLS TO BE SUPPLIED WITH THE SET

The following tools shall be handed over to the Engineer before completion of the contract:-

Item	Details	Price (KSh.)
1.	Metal tool box with lock and 2 keys	
2.	Set of 8 No. Chrome Vanadium ring spanners in size to suit the set	
3.	Ditto open ended spanners	
4.	Set of 3 screwdrivers, 75mm 200 mm and 300 mm plus 200 mm Philips type.	
5.	One set of feeler gauges	
6.	One greases gun to suit greasing points	
7.	One oil can, trigger type	
8.	One Hydrometer and plastic filler bottle with pouring spout	
Total carried forward to Summary on Page 3		

The tenderer shall give below details of any special tools which he recommends should be purchased as an optional extra.

	Details	Price (KSh.)
Total carried forward to Summary on Page 3		

Signed (as in tender)

Date

SCHEDULE NO. 1.6

LIST OF SPARE PARTS AND LUBRICANTS TO BE SUPPLIED WITH THE SET

The following items shall be handed over to the Engineer before completion of the Contract. They shall not be used by the Contractor to carry out his normal maintenance.

Item	Details	Price (KSh.)
1.	Oil filters 12 No./3 No	
2.	Air filters 12 No.3 No.	
3.	One injector to suit the set	
4.	One set of fan belts comprising belts	
5.	One set of indicator lenses comprising.....bulbs	
6.	One set of indicator lenses comprising lenses	
7.	One overall kit	
8.	One set of fuses	
9.	One 200 litre drum of sump oil of grade.....	
10.	One 2 kilogram tin of grease of grade.....	
11.	One 10 litre plastic container of distilled water	
Total carried forward to Summary on Page 3		

The tenderer shall give below details of any other spares which he recommends should be purchased as an optional extra.

	Details	Price (KSh.)
Total carried forward to Summary on Page 3		

Signed (as in tender)

Date

SCHEDULE NO. 1.7

FUEL STORAGE TANK

The tenderer shall insert his prices for the following items.

<u>ITEM</u>	<u>DETAILS</u>	<u>PRICE (KSh.)</u>
1.	Generator set fuelling enough for 9 hours running	
2.	Daily service tank 5000 mm x 2000 mm x 2000 mm full of fuel 20,000 litres and its stand.	
3.	50mm diameter pipe 50m long complete with plugs for fuel transfer from service tank storage and generator tank.	
Total carried forward to Summary on Page 3		

Signed (as in tender)

Date:

SCHEDULE NO. 1.8

EARTHING

The tenderer shall insert his prices for the following items. The configuration of the earth field shall be as directed by the Engineer on site.

Item	Details	Price (KSh.)
1	Supply and install 1000mm x 1000mm copper tape mesh 25mm x 3mm in 1200mm x 1200mm x 800mm earth pit and allow for the filling of pit with red soil and charcoal.	
Total carried forward to Summary on Page 3		

Price per additional earth mat.....KSh.

Prices per additional metre tape..... KSh.....

Signed (as in tender)

Date:

ELECTRICAL WORKS SUMMARY PAGE

Item	Description	Total Cost (Kshs)
1.00	Electrical Installations and associated works	
2.00	Fire Alarm & Evacuation System	
3.00	Lifts Installations	
4.00	Generator Installations	
5.00	Allow PC sum for ICT & Structured Caling (KSH 15,000,000.00)	15,000,000.00
6.00	Allow PC sum for Audio Visual, Public Adress & conferencing Systems (KSH 10,000,000.00)	10,000,000.00
7.00	Allow PC sum for Security and Hotel Management (KSH 15,000,000.00)	15,000,000.00
	Total Carried Forward to form Tender	

REPUBLIC OF KENYA



PARLIAMENT
OF KENYA

PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR

PARLIAMENTARY SERVICE COMMISSION
PARLIAMENTARY JOINT SERVICES

ON LR NO. 28172

TENDER REF NO PJS/012/2021-2022

BILL OF QUANTITIES-MECHANICAL SERVICES INSTALLATIONS

PROJECT CONSULTANTS

ARPRIM CONSULTANTS

P.O. BOX 12969-00400

NAIROBI, KENYA.

EMPLOYER

PARLIAMENTARY JOINT SERVICES

P.O. BOX 41842-00100

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**TECHNICAL SPECIFICATIONS
(PLUMBING, DRAINAGE & FIREFIGHTING INSTALLATIONS)**

TABLE OF CONTENTS

1.1	Technical Specifications (Plumbing & Drainage)	1.1-2
1.1.1	General Specification - General Requirements	1.1-2
1.1.2	Installation Methodology	1.1-13
1.1.3	Inspection, Testing And Commissioning	1.1-20
1.2	Technical Specifications (Firefighting)	1.2-30
1.2.1	Introduction	1.2-30
1.2.2	Statutory Obligations And Other Regulations	1.2-30
1.2.3	Execution Of Works	1.2-32
1.2.4	Pipework Valves And Fittings	1.2-33
1.2.5	Hydrant And Hose Reel System	1.2-43
1.2.6	Automatic Sprinkler System	1.2-46
1.2.7	Tanks And Pumps	1.2-52
1.2.8	Gaseous Extinguishing System	1.2-57
1.2.9	Miscellaneous	1.2-64
1.2.10	Commissioning And Acceptance Test	1.2-71
1.2.11	General Maintenance Requirements	1.2-78
1.2.12	Emergency Inspections, Tests And Repairs	1.2-80
1.2.13	Certificate Of Maintenance	1.2-81
1.2.14	Handover Of Fire Service Installation	1.2-81

1.1 TECHNICAL SPECIFICATIONS (PLUMBING & DRAINAGE)

1.1.1 GENERAL SPECIFICATION - GENERAL REQUIREMENTS

1.1.1.1 Installations to Comply with This General Specification

The Plumbing and Drainage Installations shall comply with this General Specification which details the intrinsic properties (including materials and workmanship) of the Installations in so far as it is not overridden by the Conditions, Particular Specification, Drawings and/or written instructions of the Engineer.

1.1.1.2 Scope of the Installations

This General Specification, Particular Specification, Tender Equipment Schedule and Drawings detail the performance requirements of the Installations. The Installations to be carried out in accordance with this General Specification shall include the design where specified, installation and supply of all materials necessary to form a complete installation including any necessary tests, adjustments, commissioning and maintenance as prescribed and all other incidental sundry components together with the necessary labour for installing such components, for the proper operation of the Installations.

1.1.1.3 Statutory Obligations and Other Requirements

1.1.1.3.1 Technical Standards

KEBS, BS, BS EN, ISO Standards, IEC Standards and Codes of Practice, etc. shall be deemed to include all amendments, revisions and standards superseding the standards listed herein, which are published before the date of first tender invitation for the Contract or the Nominated Sub-contract (as appropriate) unless otherwise specified.

1.1.1.3.2 Case of Conflict

The documents forming the Contract are to be taken as mutually explanatory of one another but in case of ambiguities or discrepancies the same shall be dealt with in accordance with the Conditions.

1.1.1.4 Execution of Installations

1.1.1.4.1 The International System of Units (SI)

The International System of Units (System International d'Unites) of weights and measures shall be used for all materials, equipment and measurements.

1.1.1.4.2 Programme of Installations

The P&D Contractor shall submit to the Engineer a detailed programme of the Installations within 4 weeks from the acceptance of his tender showing the intended method, stages and order of work execution in coordination with the building construction programme, together with the estimated duration for each and every stage of the Installations. The programme shall include at least the following: -

- (a) Dates for the placement of orders for equipment and materials;
- (b) Expected completion dates for builder's work requirements, i.e. when work site needs to be ready;
- (c) Delivery dates of equipment and materials to the Site;
- (d) Dates of commencement and completion of every stage of the installations in line with the building construction programme, i.e., each floor level and/or zone area;
- (e) Dates of documents /drawings submissions to relevant Government departments to obtain the necessary approvals;
- (f) Dates of requirement of temporary facilities necessary for testing & commissioning;
- (g) Dates of water supply and drainage/sewage pipe connection
- (h) Dates of completion, testing and commissioning; and
- (i) Short term programmes showing the detailed work schedules of coming weeks and months shall also be provided to the Engineer. Programmes shall be regularly updated to reflect the actual progress and to meet the PD Contractors' obligations under the Contract.

1.1.1.4.3 Builder's Work

All builder's work including openings or holes through building structure or partition walls; trenches, ducts and cutting; and all plinths, concrete bases, supports, ducts, etc. required for the Installations will be carried out as part of the building works by the Building Contractor at the expense of the Employer provided that the PD Contractor has submitted full details of such requirements within a reasonable time to the Engineer for approval, so that due consideration may be given before the Building Contractor commences the building works in accordance with the building programme in the areas concerned. After obtaining the said approval of the Engineer, the PD Contractor is required to mark out at the relevant locations of the Site the exact positions and sizes of all such works

and to provide detailed information of such works to the Building Contractor to facilitate him to carry out the builder's works as the works proceed.

All "cutting-away" and "making-good" as required to facilitate the PD Contractor's works will be carried out by the Building Contractor, except for minor provisions required for the fixing of screws, raw plugs, redhead bolts, etc. which shall be carried out by the PD Contractor. The PD Contractor shall mark out on Site and/or supply drawings of all "cutting-away" to the Building Contractor within a reasonable time.

All expenses properly incurred and losses suffered by the Employer as a result of the PD Contractor's failure to comply with the above requirements are recoverable by the Employer from the PD Contractor as a debt under the Contract or via the Building Contractor as if it is a debt liable to the Building Contractor under the Sub-contract as appropriate.

The PD Contractor shall ensure that such works are essential for the execution of the Installations. In the event that any of such works is proved to be nonessential, unnecessary and/or abortive, the PD Contractor shall bear the full cost of such works including but not limited to any unnecessary or incorrect cutting away and making-good and shall reimburse the Employer for all cost incurred in this connection are recoverable by the Employer from the PD Contractor as a debt under the Contract or via the Building Contractor as if it is a debt liable to the Building Contractor under the Sub-contract as appropriate.

1.1.1.4.4 Coordination of Installations

The PD Contractor shall coordinate the Installations with those works of the Building Contractor and any other contractors and sub-contractors of the Building Contractor. The PD Contractor shall note that the drawings supplied to him only indicate the approximate locations of the Installations. He shall make any modification reasonably required of his programme, work sequence and physical deployment of his work to suit the outcome of work coordination or as necessary and ensure that all cleaning, adjustment, test and control points are readily accessible while keeping the number of loops, cross-overs and the like to a minimum.

No work shall be carried out before approval of shop drawings or equipment has been given by the Engineer. It is the PD Contractor's responsibility to co-ordinate all Mechanical works to match with the structure of the building and the proposed arch and interior design of the building including but limited to ducts, grilles, equipment, pipes, light fittings, false ceiling layout and other services to allow a completely symmetrical and coordinated installation. PD Contractor shall prepare

section as required to demonstrate all constraints and coordinate the same for resolving any conflicts among the services. Contractor shall ensure that all required access, clearances and false ceiling heights are achieved as per the requirements are achieved.

1.1.1.4.5 Cooperation with Other Contractors

The PD Contractor shall cooperate at all times with the Building Contractor and all other contractors and sub-contractors of the Building Contractor in order to achieve efficient workflow on the Site.

Any significant problems beyond the PD Contractor's control shall promptly be reported to the Engineer.

Access doors shall be provided by the Contractor as required to provide proper access to all valves, clean out, junction boxes and all other concealed items which are located above ceilings or in walls and in partitions, whether such accesses are shown in the drawings or not. The omission shall be brought to the attention of the Engineer before installation of equipment. All access doors shall be properly designed, sized and located to suit the service required or as directed by the Engineer and to his satisfaction.

1.1.1.4.6 Site Supervision

The PD Contractor shall keep on the Site a competent and technically qualified site supervisor to control, supervise and manage all his works on Site. The site supervisor shall be vested with suitable powers to receive instructions from the Engineer.

All tradesmen must be experienced in the trade and the work carried out shall be consistent with good practice in Kenya and to the satisfaction of the Engineer. In this connection, the PD Contractor's attention is drawn to the Special

1.1.1.4.7 Sample Board

The materials offered for approval shall be strictly in accordance with the specifications and tender drawings. The contractor shall submit in triplicate, the technical literature for each item of the equipment, he intends to use for the project, to the consultant for the necessary review and approval. If in case the technical literature is not available, then a sample shall be submitted in the absence of either of these, typed technical data shall be submitted duly supported by telex / letter of the manufacturer for confirmation. In case of items involving aesthetic, sink taps, Showers, Draw offs etc., samples must be submitted for approval along with the materials

submittals. Each copy of the submittals shall be numbered and signed with the technical literature clearly highlighted, indicating the model, type and capacity of the equipment offered. The consultant shall retain two for copies and return one, either Approved or Not Approved, to the contractor. The contractor shall maintain and submit a status report every month, of all the Materials submittals of the Plumbing Materials & Equipments in the following proforma to the consultant:

- i. Submittal Number
- ii. Type of Material
- iii. Manufacturer / Local Agent
- iv. Date of Approval
- v. Date of Order / Order Number
- vi. Mode of Delivery (Air, Land or Sea)
- vii. ETA on Site
- viii. Status as on date of Report

Within 4 weeks of the acceptance of his Tender and prior to the commencement of the Installations, the PD Contractor shall submit to the Engineer for approval a sample board of essential components proposed to be used in the Contract. However, the PD Contractor may request the Engineer in writing for a longer period for submission if 6 weeks are practically insufficient.

Items displayed shall be deemed to be adequate for the Installations unless otherwise clearly indicated. Each sample, with clear numbering and labeling, shall be firmly fixed onto a rigid wooden or metal board. A list shall also be affixed on the sample board to show the item description, make and brand, country of origin and locations of installation (if not generally used). Samples rejected by the Engineer shall be replaced as soon as possible. Upon approval of all items, the Engineer will endorse the list on the sample board and the PD Contractor shall deliver the board to the site office for reference.

The following items shall be included in the sample board as a minimum:

- i. Pipe work, fitting and their support complete with fixing accessories;
- ii. Valves; and
- iii. Vibration isolator

Additional items may be required by the Engineer and/or specified in the Particular Specification

1.1.1.4.8 Material Inspection

The contractor shall inform the consultant within one week upon receipt of all the materials at the site and arrange for the inspection of the same. Any material used at site which is not approved earlier specifically shall stand rejected without notice. Any item on supply differs from the one shown on the submittal catalogue copy or the sample submitted shall also be rejected at site. In such cases, the contractor shall make a fresh submittal for the item and obtain approval from the Consultant. Any time delay caused due to the above shall be on the Contractor's account. The contractor shall have to remove the rejected materials from the site and replace with approved materials at his own expenses. In the event the contractor fails to do so, the client shall have the liberty to carry out such works from other agencies and debit the ensuing amount to the Contractor.

1.1.1.4.9 Equipment Deviations

Subsequent to the award of the Contract, and only in exceptional circumstances where it is demonstrated in writing by the PD Contractor that the original equipment offered cannot be obtained, the Engineer may consider and accept, in writing, alternative equipment and materials proposed by the PD Contractor provided always that these are fully in compliance with the relevant Specifications and Drawings and do not impose any additional contractual or financial liabilities onto the Employer.

In the event that the approved alternative equipment or material is lower in price than the original offered equipment or material, the net difference in price between the original offered equipment or material and the approved alternative equipment or material with the executed quantities of the relevant work item shall be deducted from the Contract Sum in accordance with the Contract. The Contract Sum, however, shall not be adjusted where the approved alternative equipment or material is higher in price than the original offered equipment or material.

1.1.1.5 Drawings and Manuals

1.1.1.5.1 Drawings in Electronic Format

The PD Contractor shall provide drawings in electronic format as required in the following clauses. These drawings shall conform to the latest version of CAD Standard.

1.1.1.5.2 Installation Drawings

1.1.1.5.2.1 Drawing Submission Schedule

The Plumbing tender drawings related to this project have been listed in the Schedule of Drawings enclosed with the specifications. The tender drawings have been prepared to show the tenderer the principal equipment and general arrangement required for the project. These drawings do not indicate every detail of the work. It is the Contractor's responsibility to check the positions / locations at site. All dimensions are tentative and shall be checked with the Architectural and Structural drawings. Any discrepancy shall be brought to the attention of the consultant, in writing at the time of tender. Particular attention shall be paid to the positioning of draw offs, valves, and other accessories, in relation to the Interior finishes and locations of various appliances. The Contractor is deemed to have studied the services drawings based on all the local regulations and have included in his prices for all builders' work associated with these drawings.

The PD Contractor shall submit a detailed installation drawing submission schedule and programme to the Engineer. The PD Contractor shall allow reasonable time in the programme for vetting of the installation drawings by the Engineer and for drawing resubmissions as necessary.

The PD Contractor shall provide at least 6 hard copies and one electronic copy, unless otherwise specified in the Contract or the Sub-contract as appropriate, of the approved installation drawings to the Engineer for distribution.

Unless otherwise indicated or instructed, the PD Contractor shall, in the stated or in adequate time before each section of the work proceeds, prepare, and submit for acceptance by the Engineer, detailed installation drawings and/or shop drawings (which may also be referred to as working drawings) to demonstrate how they propose to install the works both in 'Detail' and 'Form' to facilitate the practical installation. These drawings shall be fully dimensioned and shall be based on the basic intentions of the Drawings but shall not be simply a copy of them.

1.1.1.5.2.2 Size of Installation Drawings

Drawings submitted by the PD Contractor shall only be of standard sizes from A0 to A4 or B1 size as stipulated in ISO 5457:1999.

PD Contractor's 'Installation Drawings' and/or 'Shop Drawings' shall be prepared to such scales that will clearly show all necessary details.

The drawings shall be prepared to the same sheet sizes and scales as used for the ultimate 'As-Installed' record drawings.

1.1.1.5.2.3 Contents of Installation Drawings

In accordance with the provisions of this General Specification and as stated elsewhere in the Contract, the installation drawings must incorporate details of the actual plant and equipment items as approved by the Engineer.

The PD Contractor shall ensure all installation drawings are accurate representation of the Installations, before submitting them to the Engineer. All installation drawings shall be fully dimensioned and suitably scaled showing construction, sizes, weights, arrangements, operating clearances and performance characteristics.

a) "Installation drawings" shall generally include, but not limited to, the following: -

- Symbols and notations same as and compatible with the Drawings' standard;
- Complete layout/assemblies including all necessary minor items and accessories;
- Positions of all fixings, hangers and supports;
- Maintenance spaces for all withdrawable items, such as coils, heater elements, thermometers, thermostats, fan shafts and fan blowers, cleaning and replacement of tubes, removal of guards, etc.;

b) Pipework Installation Drawings

Prior to the commencement of any manufacture, fabrication, or installation, the PD Contractor shall submit to the Engineer for technical appraisal installation drawings for the pipework installation. Generally, the drawings shall be drawn to a scale of not less than 1:50. Subject to the Engineer's approval a scale of 1:100 may be adopted where the installation is a simple one.

The locations of Sink taps, showers, draw offs and their piping routes, etc., as indicated on the tender drawings is tentative and may require some variation to suit the site requirements. The exact positions must be checked and shown on the detailed working drawings as indicated on the detailed architectural drawings and coordinated with furnishing and other services.

The drawings shall indicate the location, with dimensions given, of all pipework in relation to the building structure and other pipework and equipment. The position of all valves, strainers, check valves, etc. shall be shown together with clearances necessary for removal of strainer baskets, internal parts of all valves, motors for motorized valves, solenoids, etc.

Positions and details of all hangers and supports shall be shown and the positions dimensioned.

Positions of thermostats, thermometers, test pockets and similar devices shall be shown and dimensioned including clearances required for their removal.

Details and outline of insulation and insulation boxes shall be shown including clearances required for removal of the boxes.

c) Special Plant Rooms Co-ordination Work

Unless otherwise stated in the Contract, in the case of a plant room where the PD Contractor's equipment constitutes the major item involved (i.e. as in the case of pump room), the PD Contractor shall allow in the Tender for taking effective responsibility for the coordination of other services/building details within these specific areas.

1.1.1.5.2.4 Manufacturer's Shop Drawings

The manufacturer's shop drawings are drawings for equipment or plant to be manufactured by a specialist manufacturing supplier in their own workshops and places away from the Site.

The drawings shall show detailed construction, principal dimensions, weights and clearances for maintenance, etc. Immediately after placing of any order or at any event within 4 weeks unless otherwise approved in writing by the Engineer, the PD Contractor shall forward to the Engineer for comment, 4 copies of manufacturer's shop drawings indicating detailed construction, principal dimensions and weights, clearances for withdrawals and/or cleaning, etc. No work shall proceed on or off Site unless drawings requiring approval are so approved in writing by the Engineer

1.1.1.5.2.5 Checking Drawings of Other Trades

The PD Contractor shall follow the design intent of the Drawings in planning and carrying out the work and shall cross check with other trades in order to verify the line, level, space and sequence in which the Installations is to be installed.

If directed by the Engineer, the PD Contractor shall, without extra charge, make reasonable adjustments to the proposed installation drawing layouts as are necessary to prevent conflicts with the work of other trades or for the proper sequence of and execution of Works. Where such modifications are of a nature and of such unforeseen complexity that they involve

unreasonably extra work not covered by the Contract, they may be covered by variation order to be issued by the Engineer wherever such a requirement is justified.

1.1.1.5.3 **As-Built Drawings**

1.1.1.5.3.1 *Submission of As-built Drawings*

The PD Contractor shall submit 3 sets of the first draft prints of as-built drawings within 28 days of the issuance of the certification of completion in accordance with the Contract to the Engineer for checking. The Engineer after checking the above draft prints shall return one set of the marked up copies of these as-built drawings to the PD Contractor within 42 days from the date of submission of the PD Contractor's draft prints with comments. The PD Contractor shall within a further 28 days from the date of receiving the Engineer's comments on the draft as-built drawings re-submit to the Engineer for his approval another 3 sets of the second draft prints of as-built drawings with the Engineer's comments incorporated. This process of submission and approval shall continue until the final approval of the Engineer on these as-built drawing is obtained.

The final approved as-built drawings shall be in 3 sets of hard copy and 3 sets of electronic copies. These shall be submitted within 21 days from the date of final approval. Each electronic copy shall be in the form of CD-ROM, labelled, with cross reference to a printed list of files explaining the contents and purpose of each file and supplied in sturdy plastic containers.

The detailed requirements and the media of as-built drawings set out in the Contract shall be followed as appropriate.

1.1.1.5.3.2 *Size of As-built Drawings*

As-built drawings shall only be of standard sizes of A0, A1 or B1 size as stipulated in ISO 5457:1999. Smaller size (A2 to A4) is accepted for installation drawings.

1.1.1.5.3.3 *Content of As-built Drawings*

The PD Contractor shall ensure all as-built drawings are accurate representation of the Installations, before submitting them to the Engineer. The as-built drawings required to be provided by the PD Contractor for various types of the Installations shall include, but not limited to the following: -

- (a) Plumbing and drainage layout plans such as pipe arrangement, valve arrangement, sanitary fitments arrangement, etc.;
- (b) System schematic diagrams; and
- (c) Installation details and assembly drawings such as pipework, sanitary fitments, etc. "As-built" drawings shall complete with all details to be used for commissioning purposes. Any amendments noted on these drawings during the commissioning and test stage shall subsequently be transferred to the original "As-built" drawings once the amendments have been accepted by the Engineer

1.1.1.5.4 Operation and Maintenance (O&M) Manual

The PD Contractor shall refer to the Specifications for any other requirements in O&M Manual.

The O&M Manual is for use by the maintenance agent of the completed Installations. It shall contain detailed technical information covering both operation and maintenance aspects of the Installations.

Operating and maintenance manuals shall contain the following:

- a) A description of the buildings to which services are applied stating their duty and functions,
- b) A listing and description of the services as installed,
- c) Details of the manufacturer's installation, operating and maintenance requirements which must be edited or otherwise reproduced to be specific for the installation.
- d) A detailed list of equipment supplied, manufacturer, address, telephone number and official order number/date,
- e) A schedule detailing the regular maintenance requirements with space for remarks and service history,
- f) A fault tree analysis of the system(s),
- g) A copy of the "As fitted" record drawings,
- h) Copies of all test and commissioning data including pre-commissioning check lists,
- i) A schedule giving the finally adjusted set points for plant, equipment and controls,

- j) A detailed listing of all spare parts giving part number and description, typical cost and availability,
- k) Any item deemed necessary by the Engineer to clearly identify to the use/operator the function and intended performance of the plant and system.

1.1.1.5.5 Damaged Material

Any plant or material that is damaged by any means whatsoever shall not be used in the works. Should the contractor wish to rectify such damage in order to utilize the plant or materials in the permanent works, the matter shall be brought to the attention of the Consultant, who in turn shall conduct a proper survey after which the necessary instructions shall be issued. Only after obtaining a written permission from the Consultant, shall any remedial work be carried out. Any damaged Plant or Material allegedly brought to a "as-new" condition following such a procedure, shall only be accepted after the technical appraisal & discretion of the Consultant, whose decision in such matters shall be final and binding.

1.1.2 INSTALLATION METHODOLOGY

1.1.2.1 Installation of Above Ground Drainage Systems

1.1.2.1.1 General

Foul water drainage above ground shall be installed generally to BS EN 12056-2: 2000.

Bolted access doors or inspection units shall be provided to all branches and bends (other than ventilating and anti-syphon pipes) and at the foot of main soil stacks. Access doors to cast iron soil stacks shall be fitted with gunmetal bolts.

1.1.2.1.2 Handling and Storage

Store rubber jointing rings in protective bags and do not expose them to sunlight. Avoid any deformation.

Do not expose plastic pipes and fittings to sunlight and avoid any deformation.

Store pipes, gutters and fittings under cover and clear of a leveled, well-drained and maintained hard-standing ground

1.1.2.1.3 **Fixing Pipes and Fittings**

General Details

Inspect pipes and fittings inside and out before fixing. Reject any which are defective.

Fix pipes and fittings securely with fixings and fastenings appropriate to the location and the material.

Protection to Movement and Expansion

Make adequate provision to control and/or allow for thermal movement in the length of pipes and gutters depending on material specified and in accordance with details shown on the Drawings.

Provide expansion joints in plastic pipes by means of loops or other methods in accordance with the manufacturer's recommendations.

Protection to Movement and Expansion

Unless otherwise approved by the Engineer, pipes shall not run over electrical switchgear; inside transformer room, switch room, generator room, meter room, telephone equipment room, PABX room, riser duct for electrical services, or any other rooms containing electrical hazard.

1.1.2.1.4 **Jointing Pipes and Fittings**

Carry out all pipe joints in accordance with the manufacturer's instructions and do not allow jointing material to project into bore of pipes or fittings. Cut ends of pipes and gutters clean and square, chamfering internally or externally if required using equipment appropriate to the material.

1.1.2.1.5 **Pipework Support**

1.1.2.1.5.1 *General*

Support pipes on flat roofs and canopies at least 150 mm above roof and canopy finish on concrete blocks with pipe clamps. Do not use branch pipes that connect to vertical pipes as pipe supports.

Corrosion-resistant fixings such as stainless steel brackets and connections or similar corrosion-resistant fixing supports shall be used. The fixings shall be properly anchored into solid wall.

Pipe brackets shall be of stainless steel to BS EN 10088-3: 2005 number 1.4301 or SAE Grade 304 or other approved material. The pattern shall suit the type of pipe and the surface to which they are to be fixed, including where appropriate:

- (a) Flanged ends for building in;
- (b) Plain round ends for fixing in drilled holes with an approved grout;
- (c) Approved expanding bolts or stud anchors for fixing to concrete, brickwork etc.;
- (d) Threaded ends for fixing to steelwork, or wood, or panel wall with plug as required;

Plugs for fixing to hard materials shall be of proprietary plastic, fibre, soft metal or similar material. Plugs for fixing to friable materials, plasterboard and the like shall be of proprietary fixings specially designed for the purpose. Plugs containing asbestos shall not be used.

1.1.2.1.5.2 Pipe Bracket Intervals

Pipe bracket shall be installed at intervals not exceeding those shown in Table 1.5.2 for straight runs, and with not less than one bracket per length of pipe. All brackets shall be equally spaced

Table 1.5.2 - Spacing of Pipe Fixing

Pipes	Nominal Size (mm)	Maximum Spacing (mm)	
		Vertical pipes	Horizontal pipes
Cast iron and ductile iron	All	3000	1750
Steel	Up to 15	2400	1800
	20 and 25	3000	2400
	32 and 40	3000	2700
	50 and 65	3600	3000
	80 and 125	4500	3600
UPVC	Up to 25	1500	750
	32	1800	900
	40 and 50	2000	1000
	65 to 150	2500	1200

1.1.2.1.6 Pipework Penetrating Building Structure

1.1.2.1.6.1 Pipes through Walls and Floors

Where pipes pass through walls or floors:

- a) Cast or build in UPVC sleeves to BS 3505: 1986 or BS EN ISO 1452-1: 2009 with 2 to 12 mm clearance to allow for expansion and movement of pipe
- b) Finish sleeves flush with finished face of walls and ceilings and projecting 100 mm above finished floor level.
- c) Provide loose plastic or chromium plated cover plates, when specified, to ends of sleeves visible in completed work. Plates shall be 50 mm larger than the external diameter of pipe and either clipped to the pipe or screwed or plugged and screwed to the adjacent surfaces.
- d) If required to be water tight, point with approved mastic sealant.
- e) No split PVC sleeves shall be permitted

1.1.2.1.6.2 Pipes through Fire Rated Walls and Floors

Where pipes pass through fire rated walls or floors which are not fire compartment walls or floor:

- a) For metal pipes pass through fire rated walls or floors which are not fire compartment walls or floors, either of the following shall be used:

The installation shall be as Clause B3.6.1 but

- Cast or built in galvanized mild steel pipe sleeves to BS EN 10255: 2004 with 20 mm clearance.
 - Well caulk the voids between the pipes and the sleeves for the full length with mineral wool or approved equivalent material designed for fire separation purposes in compliance with the Code of Practice for Fire Safety in Buildings.
- a) For non-metal or plastic pipes pass through fire rated walls or floors which are not fire compartment walls or floors, firmly fix sealing system around the pipes to properly seal up the voids between the pipes and the fire rated walls or floors in compliance with the Code of Practice for Fire Safety in Buildings. The sealing system shall be tested to BS EN 1366-3: 2009 or BS 476-20: 1987

Where pipes pass through fire compartment walls or floors:

- a) For metal pipes pass through fire compartment walls or floors, suitable intumescent coating or sealant shall be used to maintain the required fire

compartment. The sealing system shall be tested to BS EN 1366-3: 2009 or BS476-20: 1987 and the installation of which shall be in accordance with the manufacturer's recommendations.

- b) For non-metal or plastic pipes pass through fire compartment walls or floors, suitable fire collars shall be used. The fire collars shall be tested to BS EN 1366-3: 2009 or BS 476-20: 1987 with integrity not less than of the fire compartment walls or floors as prescribed under the relevant Building Regulation and the Code of Practice for Fire Safety in Buildings. The fire collars shall be fixed at underneath of fire compartment floors or walls or other locations around the pipes in accordance with the manufacturer's recommendations.

1.1.2.1.6.3 Pipes through Basement Wall

Where pipes pass through external basement walls:

- a) Cast or build in cast iron or 2.5 mm galvanized mild steel sleeve to BS EN 10255: 2004 after fabrication with 2 to 12 mm clearance.
- b) Caulk space and point both ends with approved mastic sealant

1.1.2.1.7 Sumps

The construction of Sump Pit shall be in accordance with BS : 8007, 1987. All cement shall be sulphate resisting and comply with BS :4027, 1980. All reinforced concrete base slab walls and cover slab shall be cast in situ using grade 25 concrete and comply with BS:8110, Part 1, 1985. The Sump Pit shall be constructed to take into account the ground conditions, strictly in accordance with the structural engineering details. Sump pit shall be painted internally with epoxy mortar or pitch epoxy (2 coats) and externally with one coat of bituminous emulsion paint. A 600x600-mm access manholes shall be provided at the top, with heavy duty manhole covers as detailed in the schedule of manholes. If the pit is more than one(1.2) meter depth, it is shall be provided with galvanized step irons to BS: 1247, 1975 shall be provided at 30 mm centers both vertically and horizontally, the first being 450 mm below cover level. The Sump Pit height shall be governed by the following: a. height between the top of the slab and the bottom of lowest drainage pipe drained to the sump pit b. height between the bottom of lowest drainage pipe and the sump pump switch on level. c. minimum storage height of waste water. d. height between the sump pump switch off level and the height of water required to submerge the pump discharge. As shown on the drainage standard detail drawings, the pit height varies due to the above factors, therefore It shall be the contractors responsibility to fully check and verify as per site requirement for the height needed to suit the site condition.

1.1.2.2 Manholes

Manhole covers and frames shall comply with BS 497:1976 and shall be of the sizes and types as shown on the contract drawings. In general, manhole covers and frames shall be one of three types, as follows unless otherwise specified. Heavy Duty to BS 497 Grade A Medium Duty to BS 497 Grade B Light Duty to BS 497 Grade C

1.1.2.3 Pipe Entries into Buildings

Pipe entries into buildings shall be sealed with mastic compound and plugged after installation of pipework to prevent the ingress or egress of water or vermin.

1.1.2.4 Venting and Draining

Air vents and drain valves shall be provided at high points and low points respectively in all piping systems.

Automatic air vents, or air cocks where specified, shall be supplied and installed at the highest points of pipework and where necessary for the venting of air in the installation.

They shall have gunmetal or brass bodies, stainless steel floats and guides, and non-corrodible valves and seats. Each automatic air vent shall be controlled by a lock shield valve. Air release pipes shall be run to discharge at the nearest suitable visible point. Air cocks shall be nickel-plated, of the spoutless pattern and with screwed taper thread. At least two loose keys shall be provided for each type of cock installed.

Drain valves, or drain cocks where specified, shall be fitted on the lowest points of pipework or where necessary for the water drainage of the system. Plugs for drain cocks shall be ground-in. Two loose keys of forged mild steel shall be provided with each drain cock. Drain valves/cocks shall be connected to the nearest building floor drain or drain point of adequate size.

1.1.2.5 Valves, Taps and Cocks

Valves, taps and cocks shall be of the types and working pressures suitable for the systems to which they are connected and shall be accompanied with valid letters of approval issued by the Water Supplies Department.

Wherever applicable, the following British Standards for cocks and valves shall be relevant: -

- BS 1010 Part 2 Draw-off taps and above ground stop valves.
- BS 5150 Cast iron gate valves for general purposes DN Series PN 16.
- BS 5151 Cast iron gate (parallel slide) valves for general purposes DN Series PN16.
- BS 5152 Cast iron globe and globe stop and check valves for general purposes DN Series PN16.
- BS 5156 Screw down diaphragm valves DN Series PN16.
- BS 5159 Cast iron and carbon steel ball valves for general purposes DN Series PN16.
- BS 5163 Key-operated cast iron gate valves for water works purposes DN Series PN16.

Valves and fittings of PN25 or heavier duty shall be used for high pressure system.

All components in the fire service installations and equipment shall be designed to withstand at least two times the system pressure.

All valves shall be arranged so that clockwise rotation of the spindle closes the valve.

Valves shall not be installed at locations with a change in direction of the pipework.

Isolating valves shall be of the full way gate type. Regulating valves shall be of globe type, unless otherwise specified. Globe valves shall be positioned so as not to prevent draining of the system.

Bodies of valves and cocks up to 50 mm shall be of cast gunmetal or bronze. Valves having heavy pattern hot-pressed bodies may be used subject to the approval of the Engineer. Valves over 50 mm shall have cast iron bodies.

All working parts shall be of gunmetal or bronze or stainless steel. Spindles shall be of high tensile bronze, forged brass or stainless steel with Teflon or approved packing to the manufacturer's standard. Gate valves shall have split or solid wedge gates of bronze with bronze seats. Disc valves shall have renewable discs free to rotate on the spindle.

Valves and cocks for installation in screwed jointed pipework shall have taper screwed ends. Flanges of flanged valves shall be to BS 4504 for PN16 rating.

Operating hand wheels shall be of malleable iron, or of approved composition having metal insert for securing positively to the stem.

Outlets valves on fire service water tanks, sprinkler installation, and elsewhere as specified, shall have padlocks and leather straps capable of locking the valves in the "OPEN" position.

Non-return valves shall have flaps of light construction pivoting on gunmetal, bronze or stainless steel spindle. The valves shall be fitted with stops to prevent undue movement and sticking of the flap and shall be quiet in operation. The valve shall be so constructed that minimum resistance is offered in the normal direction of flow.

Pressure reducing valves for direct connection in hosereel branch pipes, and elsewhere as specified, shall be of approved spring-loaded relay-operated type or otherwise constructed to prevent high pressure build-up on the low pressure side, and shall be supplied and installed with strainer and by-pass valves. Pressure reducing valves for hydrant outlets (parity valves) shall be of the type having relief connection to drain unless otherwise specified

1.1.3 INSPECTION, TESTING AND COMMISSIONING

1.1.3.1 General

Throughout the execution of the installation, the PD Contractor shall be responsible for ensuring compliance with the Regulations included in Part A and shall notify the Engineer of any infringement which directly or indirectly detracts from the safe and satisfactory operation of the installation(s) whether or not such infringement relates to the works covered in the Contract or to those associated with others

The PD Contractor is required to appoint a competent and experienced testing and commissioning engineer responsible for the overall planning, organizing, coordinating, supervising and monitoring of the testing and commissioning works and also certifying all results and reports from the testing and commissioning works. The PD Contractor shall submit, at the commencement of the Contract, information detailing qualification and experience of the testing and commissioning engineer for the Engineer's approval.

It is necessary to require the PD Contractor to provide, at no cost to the Employer, all necessary equipment, apparatus, tools and materials for carrying out of testing and commissioning works.

To ensure that all the equipment/ fittings are provided to specifications, allow for factory visits to the manufacturing factories to witness all the relevant factory tests and inspections before approval of shipping is given. Note that the client's and consultants' travel and allowances are catered for by the client. The contractor shall however facilitate the visa processing by arranging for invitation letters and any other necessary items required for this travel.

1.1.3.1.1 Master Programmed of Testing and Commissioning Works

The PD Contractor is required to submit a programme for testing and commissioning works shall be submitted at the commencement of the Contract, usually within the first three months. The programme shall indicate the tentative dates of all tests and commissioning works that will be carried out throughout the whole contract and all necessary submissions and approval relating to testing and commissioning and ensure that the testing and commissioning programme matches the master programme for construction and that all testing and commissioning works are complete before the completion date of the Contract.

1.1.3.1.2 Inspection, Testing and Commissioning Methods and Procedures

The PD Contractor is required to submit detailed inspection, testing and commissioning methods and procedures together with report formats for reporting inspection, testing and commissioning results for the Engineer's approval at least four months before commencement of testing and commissioning works, or four months after the commencement of the Contract, whichever is earlier

1.1.3.1.3 Labor and Materials

The PD Contractor is required to be responsible for provision of all labour and both consumable and non-consumable materials for carrying out testing and commissioning works at their expenses. Electricity supply, water and LP gas and town gas for carrying out of testing and commissioning works shall also be arranged and provided by the PD Contractor at no cost to the Employer

1.1.3.1.4 Supply of Inspection, Measuring and Testing Equipment

The PD Contractor is required to supply the calibrated equipment and instrument for testing and commissioning works in accordance with the requirements as specified in the Particular Specification.

1.1.3.1.5 *Readiness for Commissioning and Testing*

The PD Contractor is required to check the completion of the works to be tested or commissioned, the associated builder's works and the associated building services installations to ensure that testing and commissioning can be proceeded in a safe and satisfactory manner without obstruction.

"Type-test" for equipment shall be carried out at the manufacturers' works or elsewhere appropriate in order to demonstrate their compliance with the Regulation or requirements. "Type-test" certificates together with the corresponding drawings, sketches, reports and any other necessary documents shall be submitted to the Engineer for approval before delivery of the equipment.

Prior to the testing and commissioning works, the PD Contractor shall check the completion of the installation works, associated builder's work and related building services installations, to ensure that commissioning can be proceeded without obstruction. Before any installation is subjected to commissioning and site testing, it shall be thoroughly cleaned both internally and externally. All pipes shall be thoroughly cleaned and flushed before filling with water.

The PD Contractor shall be responsible for initially setting the plants to work including:

- a) Preliminary checks to ensure that all systems and system components are in a satisfactory and safe condition before start up;
- b) Preliminary adjustment and setting of all plant and equipment consistent with eventual design performance;
- c) Carrying out pressure test, hydraulic test and other tests required before energising the equipment and plant;
- d) Checking the proper functioning of the protective devices and safety valves in the installation and carrying out all necessary safety testing;
- e) Energising and setting to work on all plants; and
- f) Initial regulation and demonstration that the installation delivers the correct rate of flow at the conditions specified in the Contract

For specialist plant or equipment, the PD Contractor shall arrange for it to be commissioned, certified and tested by the manufacturer's skilled commissioning engineer and/or technician.

Where the tests involved other plumbing and drainage installations already in operation in other parts of the building outside the Site or works area, the PD Contractor shall co-ordinate with relevant parties, where necessary, on the temporary suspension of other plumbing and drainage installations for the tests

The PD Contractor is required to provide advanced notice for inspection, testing and commissioning works as follows: -

a) Off-site Inspection and Testing

An advanced notice of at least one week before commencement of the inspection or test shall be provided.

b) On-site Inspection, Testing and Commissioning

An advanced notice of at least 4 calendar days before commencement of inspection, testing or commissioning shall be provided.

1.1.3.1.6 *Documentation and Deliverables*

The PD Contractor shall record all commissioning information and testing results at the witness of the Engineer or his representatives. Commissioning and testing record shall be properly checked and certified by contractor's Testing and Commissioning Engineer and signed by the Engineer or his representative who has witnessed the testing or commissioning before submission to the Engineer. The PD Contractor shall submit full commissioning and testing report to the Engineer within 14 calendar days after completion of commissioning and testing of the installation.

1.1.3.2 **Testing and Commissioning - Definitions**

For the purpose of this General Specification the following definitions shall apply: -

Commissioning: the advancement of an installation from the stage of static completion to full working conditions and to meet the specified requirements. This will include setting into operation and regulation of the installation.

Setting to work: the process of setting a static system into motion.

Off-site Tests: tests carried out on items of equipment at manufacturer's works or elsewhere to ensure compliance with the requirements of

Specifications and/or relevant Standards or Codes of Practice (or other standards specified).

Site Tests: tests on static plant and systems (e.g. inspection and testing of welds, hydraulic testing of pipe work, etc.) to ensure correct and safe installation and operation.

Regulation: the process of adjusting the rates of fluid flow and heat transfer in a distribution system within specified tolerances as stated in the relevant CIBSE Commissioning Code.

Performance Testing: the measuring and recording of the performance of the commissioned installation.

1.1.3.3 Testing and Commissioning - General

Any defects of workmanship, materials and performance, maladjustments or other irregularities which become apparent during commissioning or testing shall be rectified by the PD Contractor at no cost to the Employer and the relevant part of the commissioning or testing procedure shall be repeated at the PD Contractor's expenses.

The entire testing and commissioning procedure shall be undertaken by the PD Contractor's own competent specialist staff or by a competent Independent Commissioning Specialist nominated by and acting for the PD Contractor and approved by the Engineer.

Where specified in the Particular Specification, the PD Contractor shall nominate a competent independent Specialist to conduct commissioning work.

Where specified in the Particular Specification, the PD Contractor shall employ an approved specialist testing and commissioning firm who shall be named in the returned Tender Documents.

At the appropriate time in the Contract, usually within the first three months, the PD Contractor shall furnish the Provisional Testing and Commissioning Programme, methods, procedures and formats of test records to the Engineer. This shall be updated as the work progresses towards completion.

Unless otherwise indicated, all electricity, main water and other fuels, such as town gas, necessary for the operation of the plant during preliminary

runs and for full adjustments and commissioning tests will be provided at no cost by the PD Contractor unless otherwise specified in the Contract.

1.1.3.4 Off-Site Tests

Where the specified Standards or Codes of Practice stipulate, "type-tests" on items of equipment to demonstrate compliance shall be carried out at the manufacturer's works or elsewhere as appropriate. In all cases, "type-tests" Certificates shall be submitted in duplicate to the Engineer.

1.1.3.5 Site Tests

The PD Contractor shall carry out "on-site" tests in respect of all static systems to ensure safe and proper operation as conforming to the design intent. Such tests shall include test of welds and pressure tests on the hydraulic systems.

1.1.3.6 Inspection and Testing During Construction Period

1.1.3.6.1 Periodic Site Tests

Site inspections of "work in progress" will be made by the Engineer or the representative from time to time. The PD Contractor shall keep such inspection record for checking from time to time. Installations to be permanently covered up shall be subjected to inspection and test before cover up. During the inspection, if the Engineer discovers any work that has been covered up before inspection and testing, this work shall be uncovered for inspection and testing to the Engineer's satisfaction. The cost involved in uncovering the work, inspecting, testing and re-concealing the work together with any consequential losses shall be paid by the PD Contractor at no additional cost to the Employer.

1.1.3.6.2 Test at Factory

The PD Contractor shall note that the Engineer may require witness of tests and inspections of locally and/or overseas manufactured equipment during construction at the manufacturer's works. Where this requirement is indicated in the Contract Documents, the PD Contractor shall allow for making the necessary arrangements; including and indicating the Engineer's travel and subsistence expenses in the Contract

1.1.3.6.3 Factory Test Certificates

Certificates of all hydraulic and other manufacturers' tests carried out at the manufacturers' works shall be forwarded in duplicate to the Engineer for approval. This approval shall normally be required before the materials or apparatus are dispatched from the manufacturer's works.

Where specified, the PD Contractor shall subject certain materials and equipment to be tested by the recognized institutions or laboratories and submit the type test certificates to the Engineer for approval.

1.1.3.6.4 *Sampling and Analysis of Potable Fresh Water*

The PD Contractor shall conduct sampling and analysis for the quality of potable fresh water upon substantial completion of the plumbing installation. The sampling and analysis methodology shall be submitted to the Engineer for approval. Notwithstanding, the samples shall be taken at all farthest points of use in the plumbing system from the storage tank, and shall include sampling for each water supply tank in the building as minimum.

The sampling and analysis of potable fresh water for physical, chemical and bacteriological examinations shall be collected, preserved and handled using the standard techniques as listed below: -

- a) BS EN ISO 5667-1: 2006, BS EN ISO 5667-3: 2003 and BS ISO 5667-5: 2006, or equivalent standards;
- b) Annex 4 of the World Health Organization (WHO) Guidelines for Drinking Water Quality 2nd Edition Volume 3; and
- c) Section 1060 of the American Public Health Association (APHA) Standard Methods for the Examination of Water and Wastewater 20th Edition.

1.1.3.7 **Documents and Data Required for Hand-Over**

1.1.3.7.1 *General*

The PD Contractor shall note that the system cannot be handed over until all the foregoing requirements (where applicable) have been carried out to the satisfaction of the Engineer.

1.1.3.7.2 *Test Certificates*

Before the handover inspection, the PD Contractor shall provide the following test/record certificates where applicable: -

- a) Copies of manufacturer's works tests/record certificates on plant items comprising heat generating plant, heat exchangers, chillers units, packaged air conditioning units, tanks, vessels, motors, fans, pumps, etc.;
- b) Copies of hydraulic and pressure test/record certificates for works carried out on Site;
- c) Copies of boiler plant efficiency test/record certificates;
- d) Copies of Registered Surveyor's test/record certificates for pressure vessels (if any);

1.1.3.7.3 *"As-built" Drawings*

All necessary copies of "As-built" drawings as detailed in the Contract Documents and this General Specification shall be provided upon handover.

1.1.3.7.4 *Operation and Maintenance Manuals*

All necessary copies of Operating and Maintenance Manuals as detailed in the Contract and this General Specification shall be provided upon handover.

1.1.3.7.5 *Manufacturer's Name Plate*

Every item of plant supplied by a manufacturer shall be fitted with a clearly engraved, stamped or cast manufacturer's name plate properly secured to the plant item and showing: -

- Manufacturer's Name;
- Serial and/or Model No.;
- Date of Supply;
- Rating/Capacity; and
- Test and Working Pressure (where applicable).

1.1.3.7.6 *Labels and Related Instructions*

Labels and notices shall be supplied and installed for all valves and piping to facilitate operation and proper maintenance of the Installation. All labels shall make cross reference to the operation and maintenance manuals and as-built drawings

All wording shall be in both Kiswahili and English. All labels shall be of adequate size as to give clearance between lettering and fixings to ensure an aesthetic arrangement on completion, and meeting with.

SECTION 6.1

TECHNICAL SPECIFICATIONS (FIREFIGHTING)

1.2 TECHNICAL SPECIFICATIONS (FIREFIGHTING)

1.2.1 INTRODUCTION

1.2.1.1 General

This section, This General Specification details the intrinsic properties (including materials and workmanship) required of a fire service installation including hydrant/hosereel system, sprinkler system, manual and automatic fire alarm system, audio/visual advisory system, gas extinguishing system, portable appliances, pressurisation of staircases system, smoke extraction system and all associated electrical equipment and wiring.

1.2.1.2 Preference

The fire service installation shall comply in every respect with this Project Specification unless otherwise specified in the Particular Specification, the Drawings and/or Contract documents relating to a particular job or modified by written instruction of the Engineer.

The Project Specification takes preference over the standard specifications wherever the two Specifications might be in conflict.

1.2.1.3 Scope of Work

The scope of the works in these specifications consists of the whole of the labour and all materials necessary to form a complete installation and such commissioning, adjustments, tests and maintenance as prescribed or as necessary. It shall include not only the major items of plant and equipment shown or specified but all the incidental sundry components necessary together with the cost of labour for installing such components for the completion of the Works and for the proper and functional operation and maintenance of the installation whether or not these sundry components are mentioned in detail in the Contract. It shall also include co-operation with other contractors involved on the Contract site in respect of co-ordination, programming, scheduling and sequencing of installation of the works in all circumstances where stipulated in the Contract or proven as necessary in practice.

1.2.2 STATUTORY OBLIGATIONS AND OTHER REGULATIONS

1.2.2.1 Installation to Comply with Obligations, Regulations and Specification

The installation shall comply with this General Specification, and with the following statutory obligations, regulations and specifications currently in force in Kenya Government

- a) KS Code (2009) Part S
- b) BS 5588-4, *Fire precautions in the design, construction and use of buildings – Part 4: Code of practice for smoke control using pressure differentials.*
- c) BS 7346-1, *Components for smoke and heat control systems – Part 1: Specification for natural smoke and heat exhaust ventilators*
- d) BS 7974, *Application of fire safety engineering principles to the design of buildings – Code of practice.*
- e) EN 12101-1, *Smoke and heat control systems – Part 1: Specification for smoke barriers.*
- f) EN 12101-2, *Smoke and heat control systems – Part 2: Specification for natural smoke and heat exhaust ventilators.*
- g) EN 12101-3, *Smoke and heat control systems – Part 3: Specification for powered smoke and heat exhaust ventilators.*
- h) Internationally recognised equivalent standards acceptable to the local authority and demonstrated to be equivalent in terms of the type of construction, functions, performance, general appearance and standard of quality of manufacture and approved by the Engineer.
- i) Where indicated, the codes, standards and guidelines issued by the following international institutions, or internationally recognised equivalent standards acceptable to the local authority and demonstrated to be equivalent in terms of the type of construction, functions, performance, general appearance and standard of quality of manufacture and approved by the Engineer:
 - National Fire Protection Association, United States
 - Loss Prevention Council, United Kingdom
 - International Organization for Standardisation
 - American National Standard Institute
 - Committee for European Normalisation
 - Factory Mutual, United States
 - Underwriters' Laboratory, United States

1.2.2.2 Intellectual Property Rights

If the Contractor intends to use the intellectual property rights of another party in performing the Contractor's obligations under the Contract, appropriate licences shall be obtained from the relevant rights owners.

Where any software is provided in the Works, the Contractor shall submit documents showing that appropriate permission or licence has been obtained

from relevant beneficial owners of intellectual property rights for the use of the software free of all fees for the whole operating life of the Works.

1.2.3 EXECUTION OF WORKS

1.2.3.1 Programme of Works

The Fire Protection Contractor (Sub-Contractor) shall obtain the programme from the Main Building Contractor (builder) and co-ordinate the Fire Protection installation programme with that of the builder.

1.2.3.2 Builder's Work

Approved pipe sleeves and pipe collars, and approved fire rated pipe sleeves and fire rated pipe collars where necessary, shall be supplied and installed by the Contractor for all fire service pipes and the like passing through compartments, walls, floors and any structural openings. Puddle flanges for inlet and outlet pipes of the tanks for fire service shall be supplied by the Contractor and will be installed by the Building Contractor unless otherwise specified.

1.2.3.3 Training of Employer's Staff

The Contractor shall provide training for the operation and where necessary maintenance of sophisticated equipment. The training shall include all training facilities, material and handouts etc. The Contractor shall submit a training schedule and proposal at least three (3) months prior to completion of the Works for the Engineer's Approval.

The Contractor shall provide adequate training to the Employer's staff to operate the fire alarm control system and to monitor and to reset/mute alarms in the fire service installation at completion of the Works and before the commencement of the Maintenance Period. The Contractor shall provide adequate training to the Employer's staff on the operation of the fire service installation during fire alarm, fault alarm, warning alarm and other emergency situations as appropriate. The Contractor shall provide contact telephone list as necessary to the Employer's staff.

The Contractor shall provide facilities and training programme to ensure that the Employer's operation and maintenance staff, as available, acquire full knowledge and appreciation of all aspects of the design, day-to-day operation, diagnosis and where necessary, breakdown and routine maintenance, and

hence operate and maintain reasonably effectively and efficiently the system/equipment.

1.2.3.4 Sample Board

Prior to the commencement of installation work, the Contractor shall submit to the Engineer for approval in good time sample boards of electrical and mechanical accessories proposed to be used for the Contract. Each sample shall be firmly fixed onto a rigid wooden or metal board and clearly numbered and labelled. A list shall be affixed to show the item description, make and brand, name of manufacturer, country of origin, accessories to be used and locations of installation (if not generally used).

Only samples deemed to comply with the Specification shall be displayed and items shall be adequate for the whole installation unless otherwise clearly indicated as outstanding ones to be submitted later. Samples rejected by the Engineer shall be replaced as soon as possible. Upon approval of all items in a sample board, the Engineer will endorse the list of the sample board and the sample board shall be delivered by the Contractor to the Employer's site office for reference.

1.2.4 PIPEWORK VALVES AND FITTINGS

1.2.4.1 Steel Tubes and Fittings for Exposed Pipework

All tubes and fittings up to and including 150 mm diameter shall, unless otherwise specified, be galvanised mild steel of at least medium grade to BS 1387 / ISO 65 Steel tubes and tubulars for screwing to BS 21 / ISO 7/1 pipe threads. All other fittings shall be to BS 1740.

All tubes and fittings above 150 mm diameter shall, unless otherwise specified, be ductile iron to BS EN 545 Class K12 cold bitumen coated externally and internally to BS 3416 Type II.

Where specified for operation in high pressure from 1600 kPa, all tubes shall be suitable for pressure from 1600 kPa shall be carbon steel of ERW 320 to BS 3601 - carbon steel pipes and tubes with specified room temperature properties for pressure purposes, and shall have dimensions to BS 3600 - Specification for dimensions and masses per unit length of welded and seamless steel pipes and tubes for pressure purposes. All fittings shall be butt-welding type carbon steel for pressure purposes to BS EN 10253-1. All tubes on or below 150 mm diameter for high pressure from 1600 kPa shall be galvanised mild steel pipe of heavy grade to BS 1387/ ISO 65.

1.2.4.2 Copper Pipework

Copper pipework, where specified, shall comprise seamless hard drawn copper tubes manufactured to BS EN 12449 Table Z and of appropriate gauge to suit the working pressure of the system.

1.2.4.3 Underground Pipework

Pipe laid underground shall conform to one of the following specifications: -

- a) BS 1387 / ISO 65 - Steel tubes and tubular of heavy grade for screwing to BS 21 / ISO 7/1 pipe threads.
- b) BS EN 545 - Ductile iron pipes and fittings, Class K12.

If not specified in the Particular Specification, ductile iron pipes and fittings shall be of Class K12 to BS EN 545.

Mechanical pipe couplings shall be used for joints in underground pipes. Suitable mechanical pipe coupling of approved type that can provide the required allowance for angular deflection and contraction and expansion shall be used.

1.2.4.4 Pipe Sizes

Where pipe sizes are stated in this General Specification, this is intended to be the nominal bore in the case of steel tubes and the nominal outside diameter in the case of copper tubes.

1.2.4.5 Joints in Steel Pipework

Joints in steel pipework shall be made in accordance with the following general requirements, using only the highest quality materials and skilled labour.

Mechanical pipe couplings shall be employed for steel pipes of diameter larger than 65mm up to 150 mm unless otherwise specified. The pipes and fittings shall have grooved or shouldered ended suitable for the mechanical pipe couplings. It shall be a positive watertight couple providing some allowance for angular pipe deflection, contraction and expansion. The coupling assembly shall be securely held together by bolts and nuts with a water sealing gasket so designed that the internal water pressure increases the water tightness of the seal. Pipe couplings shall be of malleable iron castings and galvanised, or ductile iron castings. Pipe grooves may be cut or rolled without the removal of any metal. The entire coupling installation shall be in accordance with the published selected manufacturer's recommendations and designed to withstand two times of normal operating pressure. Where the pipes are laid underground, suitable mechanical pipe coupling of approved type that can

provide the required allowance for angular deflection and contraction and expansion shall be used.

Flanged joints and flanged fittings shall be used for steel pipe of diameter larger than 150 mm. For aboveground steel pipes with normal operating pressure higher than 1600 kPa, flanged joints and flanged fittings shall be used for pipes of diameter larger than 65mm. For pipes exposed in public accessible areas, flanged joints and flanged fittings shall be used for pipes of diameter larger than 65mm. If prior approval is obtained from the Engineer, mechanical pipe couplings may be used for steel pipes at such exposed locations up to 150 mm.

Steel pipes less than or equal to 65 mm shall be jointed with screwed fittings, screwed flanges, or screwed unions. Screwed joints shall have tapered threads to BS 21 / ISO7/1 and shall be made with approved jointing material. Where the process of cutting of threads removes galvanization, the Contractor shall apply an approved cold galvanising finish to restore the integrity of the pipe protective finish. Fittings shall be galvanized. Screwed fittings other than sockets shall be of galvanized malleable iron.

The pipes shall be fitted with screwed flanges for jointing valves and other equipment having flange connections.

Where flanged joints and flanged fittings are specified, the flanged joints and fittings shall be of factory applied flange joints for galvanized steel and ductile iron pipes.

Welded flanges are permitted for carbon steel pipes. Flanges shall be raised face to BS 4504. Flanges for steel pipe work shall be wrought iron or annealed steel, machined full face and galvanised, suitable for the working pressures to which they will be subjected. For flanged joint pipes, facilities and provisions shall be provided in the pipe system to absorb thermal movement, vibration and water hammering.

Jointing of steel pipes by welding is only permitted where specified or with the expressed permission of the Engineer. Only ungalvanised pipes of 50 mm bore or larger may be joined by welding.

1.2.4.6 Dismantling Facilities

All pipe runs shall be arranged for ease of dismantling and re-erection. Disconnecting flanges, mechanical pipe coupling or screwed unions, as applicable, shall be supplied and installed at suitable locations and at valves and equipment. Unions shall be of ground-in spherical seated type. Unions for steel pipes shall be of forged steel heavy duty pattern and unions for copper pipes shall be of gunmetal. Unions shall have hexagon bodies.

1.2.4.7 Pipework Installation

Pipework installation shall be carried out in accordance with the following general requirements.

Pitcher tees, bends, twin elbows, etc. shall be of the same size as the pipework connected to them. Bushings shall not be used. Square tees shall only be used where short sweep fittings would cause air to be trapped.

Bends shall be of long radius wherever possible. Short radius bends and elbows may be used for pipe sized up to 65 mm diameter or for pipes installed inside false ceiling or concealed ceiling void. Use of short radius bends and elbows of larger size in areas other than false ceiling and concealed ceiling void are subject to the Engineer's approval on consideration of space available for installation. Square elbow is not permitted.

Tubes shall be reamed after cutting and shall be free from burrs, rust, scale, and other defects and shall be thoroughly cleaned and treated for corrosion protection before and after erection.

Open ends left during the progress of the work shall be properly blanked off with approved metal or wood plugs or blank caps or counter flanges.

Joints shall not be made in the thickness of any wall, floor or ceiling.

Where pipes pass through ordinary walls or floors, the Contractor shall, unless otherwise specified,

- a) Cast or build in galvanised mild steel pipe sleeves with 2 to 25 mm clearance to allow for expansion and movement of pipe.
- b) Finish sleeves flush with the finished face of walls unless concealed inside false ceiling.
- c) Project sleeves at least 100 mm above finished floor level.
- d) Fill the annular space between pipe and sleeve for the full length with approved fireproof materials and non-flammable type sealant.
- e) Provide loose chromium plated steel cover plates where specified, to ends of sleeves visible in completed work. Plates shall be 50 mm larger than the external diameter of pipe and either clipped to the pipe or screwed or plugged and screwed to the adjacent surfaces.

When pipes pass through fire rated walls or floors, the Contractor shall, unless otherwise specified,

- a) Cast or build in fire rated pipe sleeve with 2 to 25 mm clearance.
- b) Finish sleeves flush with the finished face of walls unless concealed inside false ceiling.

- c) Project sleeves at least 100 mm above finish floor level.
- d) Fill the annular space between pipe and sleeve for the full length with approved fireproof materials of fire rated period not less than that of the wall and the floor through which the pipe penetrates.
- e) Provide loose chromium plated steel cover plates, where specified, to ends of sleeves visible in completed work. Plates shall be 50 mm larger than the external diameter of pipe and either clipped to the pipe or screwed or plugged and screwed to the adjacent surfaces.

Where pipes pass through building roofs, the Contractor shall, unless otherwise specified,

- a) Cast or build in fire rated pipe sleeves with 2 to 12 mm clearance projecting 150 mm above roof finish.
- b) Caulk space and void at both ends for the full length with approved fire rated sealant, e.g. mastic sealant.
- c) Cover top of sleeves with watertight stainless steel collars or similar cover as per roofing specification.
- d) Pipework shall not be embedded in the concrete structure or “grouted in” or otherwise installed in such a way as to make subsequent alterations difficult at a later date.

1.2.4.8 Pipework Supports

All pipework shall be properly supported with substantial hangers, anchors, brackets, saddles, guide, etc. to BS 3974 with adequate provision for expansion and contraction and for corrosion protection.

Pipework supports shall be arranged as close as possible to joints and changes of direction and each support shall take its share of the load. The spacing of the supports shall not exceed the centres given in the following table: -

1.2.4.9 Spacing of pipework support for mild steel pipes

Nominal Pipe Size (mm)	Spacing of Vertical Run (m)	Spacing of Horizontal Run (m)
15	2.5	2
20 and 25	3	2.5
32	3.5	3
40 & 50	4.5	3
63 & 80	5	3.5
100		4
125		4.5

150	5	5
200	7.5	7.5

Vertical rising pipework shall be supported at the base or as indicated to carry the total weight of the riser. Branches from risers shall not be used as a means of support for the riser.

Where pipework up to 50 mm is fixed to solid structure, brackets may be of the screw-on or long shank built-in type. Fixings to timber or to light-weight structure shall be of screw-on pattern. Brackets and supports for mild steel tube shall be galvanised steel or malleable iron and galvanised. Brackets for copper tubes shall be brass or gunmetal.

The pipe clip shall be detachable without disturbing the fixing.

Brackets screwed to walls shall be securely fixed by expanding plugs of adequate size or other purpose-designed fixing devices of non-combustible material. Wood plug is not permitted.

Pipework of 65 mm size and larger subjected to expansion and contraction shall be suspended on swivel hangers or hangers having equivalent functions and performance to cater for expansion and contraction. The pipe hangers and supports shall be galvanised steel or approved materials for supporting the load of the pipes.

Unless otherwise specified, hangers for horizontal pipework at high level shall be supported from angle or channel galvanised irons supplied and installed by the Contractor and suitable for building-in or otherwise secured to the structure. Tee hangers supported on two legs instead of angle hangers shall be used. Adjustable galvanised steel hangers shall be used. Pipe rings shall be of malleable iron or fabricated steel and galvanised, made in halves and secured by bolts or machine screws.

Alternatively, galvanised malleable iron hinged pipe rings may be used. Calliper type hook is not permitted.

Where integral pipe hangers are required for housing the fire service pipes and pipes for other services, the integral pipe hangers shall be of a type approved by the Engineer and supplied by one manufacturer with all the accessories. Structural calculation shall be submitted for approval. The laying of pipes on the integral pipe hangers shall be fully coordinated with other parties before installation.

1.2.4.10 Expansion Joints

Expansion joints shall be supplied and installed for all pipework passing through any building expansion joint and where necessary as specified. They shall be of axial pattern bellow type and shall have screwed or flanged ends as appropriate to facilitate replacement. They shall incorporate internal liners if required and shall be manufactured from 18/8 stainless steel or better material to the approval of the Engineer and shall be designed to withstand at least two times of the system pressure.

External protective sleeves shall be fitted. Each joint shall be securely held by guides on both sides. All expansion joints shall have a working life of not less than twenty years. Unless otherwise approved by the Engineer, flexible connector of single sphere or double sphere type made from rubber, EPDM or similar materials shall not be used as expansion joint.

1.2.4.11 Protection of Underground Pipework

Underground pipes shall be protected against corrosion and against mechanical damage. Pipework shall be cleaned after jointing and treated with two coats of good quality bituminous paint and wrapped with corrosion and water resistance self-amalgamating tapes and mastics having 55% overlapping before laying, and bedded in washed sand free of all salts or sieved soil before the trench is back filled. All joints and supports shall be appropriately wrapped. Pipework shall be hydraulically tested before the trench is back filled. Underground pipework shall be provided with suitable and approved couplings which provide allowance for angular deflection, contraction and expansion. Anchor blocks shall be made at appropriate locations to the approval of the Engineer for thrust bearing. Anchor block, trench, backfilling of trench and sand bed are included under the builder's works.

1.2.4.12 Pipe Entries into Buildings

Pipe entries into buildings shall be sealed with mastic compound and plugged after installation of pipework to prevent the ingress or egress of water or vermin.

1.2.4.13 Venting and Draining

Air vents and drain valves shall be provided at high points and low points respectively in all piping systems.

Automatic air vents, or air cocks where specified, shall be supplied and installed at the highest points of pipework and where necessary for the venting of air in the installation.

They shall have gunmetal or brass bodies, stainless steel floats and guides, and non-corrodible valves and seats. Each automatic air vent shall be controlled by a lock shield valve. Air release pipes shall be run to discharge at the nearest

suitable visible point. Air cocks shall be nickel-plated, of the spoutless pattern and with screwed taper thread. At least two loose keys shall be provided for each type of cock installed.

Drain valves, or drain cocks where specified, shall be fitted on the lowest points of pipework or where necessary for the water drainage of the system. Plugs for drain cocks shall be ground-in. Two loose keys of forged mild steel shall be provided with each drain cock. Drain valves/cocks shall be connected to the nearest building floor drain or drain point of adequate size.

1.2.4.14 Valves, Taps and Cocks

Valves, taps and cocks shall be of the types and working pressures suitable for the systems to which they are connected and shall be accompanied with valid letters of approval issued by the Water Supplies Department.

Wherever applicable, the following British Standards for cocks and valves shall be relevant: -

- BS 1010 Part 2 Draw-off taps and above ground stop valves.
- BS 5150 Cast iron gate valves for general purposes DN Series PN 16.
- BS 5151 Cast iron gate (parallel slide) valves for general purposes DN Series PN16.
- BS 5152 Cast iron globe and globe stop and check valves for general purposes DN Series PN16.
- BS 5156 Screw down diaphragm valves DN Series PN16.
- BS 5159 Cast iron and carbon steel ball valves for general purposes DN Series PN16.
- BS 5163 Key-operated cast iron gate valves for water works purposes DN Series PN16.

Valves and fittings of PN25 or heavier duty shall be used for high pressure system.

All components in the fire service installations and equipment shall be designed to withstand at least two times the system pressure.

All valves shall be arranged so that clockwise rotation of the spindle closes the valve.

Valves shall not be installed at locations with a change in direction of the pipework.

Isolating valves shall be of the full way gate type. Regulating valves shall be of globe type, unless otherwise specified. Globe valves shall be positioned so as not to prevent draining of the system.

Bodies of valves and cocks up to 50 mm shall be of cast gunmetal or bronze. Valves having heavy pattern hot-pressed bodies may be used subject to the approval of the Engineer. Valves over 50 mm shall have cast iron bodies.

All working parts shall be of gunmetal or bronze or stainless steel. Spindles shall be of high tensile bronze, forged brass or stainless steel with Teflon or approved packing to the manufacturer's standard. Gate valves shall have split or solid wedge gates of bronze with bronze seats. Disc valves shall have renewable discs free to rotate on the spindle.

Valves and cocks for installation in screwed jointed pipework shall have taper screwed ends. Flanges of flanged valves shall be to BS 4504 for PN16 rating.

Operating hand wheels shall be of malleable iron, or of approved composition having metal insert for securing positively to the stem.

Outlets valves on fire service water tanks, sprinkler installation, and elsewhere as specified, shall have padlocks and leather straps capable of locking the valves in the "OPEN" position.

Non-return valves shall have flaps of light construction pivoting on gunmetal, bronze or stainless steel spindle. The valves shall be fitted with stops to prevent undue movement and sticking of the flap and shall be quiet in operation. The valve shall be so constructed that minimum resistance is offered in the normal direction of flow.

Pressure reducing valves for direct connection in hose reel branch pipes, and elsewhere as specified, shall be of approved spring-loaded relay-operated type or otherwise constructed to prevent high pressure build-up on the low pressure side, and shall be supplied and installed with strainer and by-pass valves. Pressure reducing valves for hydrant outlets (parity valves) shall be of the type having relief connection to drain unless otherwise specified.

1.2.4.15 Pressure Gauges

Pressure gauges shall conform to BS EN 837-1 and shall have brass cases with dials not less than 100 mm diameter. They shall be calibrated in kPa to a maximum of not less than 1-1/3 times and not more than 2 times the operating pressure. Divisions of scale shall not exceed 20 kPa for a maximum scale value of 1000 kPa, 50 kPa for a maximum scale value of 1600 kPa and 100 kPa for maximum values in excess of 1600 kPa. An isolating valve/cock shall be supplied and installed for each pressure gauge.

1.2.4.16 Electric Alarm Pressure Switches

Electric alarm pressure switches shall have contact sets of silver or approved alloy rated to suit the working voltage and current of the circuits controlled and

shall have independent adjustments for the cut-in and cut-out points and for the operating differential. Electric alarm pressure switches shall be of LPCB approved type or approved by similar widely recognised independent regulatory body. The maximum working pressures of all pressure switches shall be at least 300 kPa above the maximum pressure of the water inside the pipework at the points of installation of the switches. Pressure switch shall be supplied and installed with necessary ancillary facilities and isolating valves for maintenance and hydrostatic pressure test purpose complying with NFPA 13. All isolating valves where provided shall be complete with padlocks.

1.2.4.17 Water Flow Alarm Switches

Water flow alarm switches shall be of magnetic type having the water side completely separated from the electrical side. Contacts shall be suitable for the working voltage and current of the circuits controlled, and shall be of silver or approved alloy. Water flow alarm switches shall be of a type approved by LPCB or approved by similar widely recognised independent regulatory body. They shall be capable of standing a test pressure of minimum 1500 kPa for six (6) hours without showing any sign of leakage.

1.2.4.18 Pipeline Strainers

Water strainers shall be installed in all pipelines upstream of all water pumps. For pipelines of nominal bores between 15 mm and 50 mm diameter inclusive, strainers shall be screwed gunmetal or bronze body "Y" type with brass or stainless steel screen.

For pipelines of nominal bores of 65 mm diameter or above, strainers shall be flanged with "Y" type cast iron body, brass or stainless steel screen. Strainer screen shall have straining holes of 2 mm diameter.

1.2.4.19 Ball Float Valves

Ball float valves up to 50 mm shall be of cast gunmetal or bronze body. Ball float valves over 50 mm shall be of cast iron body. They shall be with nickel alloy and stainless steel working parts. They shall be of a slow closing type and of PN10 pressure rating.

1.2.4.20 Vortex Inhibitors

Vortex inhibitors shall be LPCB approved type or approved by similar widely recognized independent regulatory body for PN16 and flanged. They shall be used for operation under positive head conditions.

1.2.4.21 Orifice Plates

Orifice plates for system balancing, pump churning water circuits, where applicable, shall be supplied and installed as required for proper commissioning of the systems. Wherever necessary to suit the pump or system performance or in respect of system balance, an orifice plates shall be supplied and installed even if they are not indicated on Drawings.

Orifice plates shall be generally constructed and installed according to LPC Rules for Sprinkler Installations. They shall be manufactured by factories producing LPCB approved equipment and UL listed sprinkler equipment or equipment approved by similar widely recognised independent regulatory body, and acceptable to the local government regulations.

Orifice plate that has been factory calibrated and produced by a factory with a quality control system in place can also be used if they are acceptable by the local government. The flow characteristic data of the orifice plate shall be included in the operation and maintenance manual.

1.2.4.22 Cleaning and Draining

All piping shall be cleaned and shall be free of scale, dirt, etc., before installation. During the course of the installation, all open ends of pipes shall be plugged or capped to prevent ingress of dirt. After installation and sealing of joints, all piping shall be thoroughly flushed with clean water under pressure, to the satisfaction of the Engineer.

Water used for this purpose shall be discharged as directed. Any temporary pipework and equipment necessary for the above cleaning work shall be provided by the Contractor.

1.2.5 HYDRANT AND HOSE REEL SYSTEM

1.2.5.1 General Requirements

The general requirements of the hydrant and hose reel system and the individual equipment installations shall comply with KS Code (2009) and local administrative authorities and Circular Letters.

The fire service inlets, hydrant outlet valves and hose reels shall comply with KS Code (2009).

1.2.5.2 Fire Service Inlets and Hydrant Outlets

Fire service inlets shall be of twin type comprising screw-down globe type stop valve with male screwed outlet of suitable bore and two 65 mm horizontal male

instantaneous inlet connections complete with integral spring loaded resilient seated non-return valves.

Hydrant outlets shall be single or double type comprising screw-down globe type stop valve for each outlet branch and with male screwed inlet of suitable bore and 65 mm female instantaneous outlets. Outlet branches shall incline at 70° from the centre line of the hand wheel, and at 90° to each other where applicable. The coupling control shall be located at the side of each outlet branch. A bronze blanking cap held captive by a suitable chain shall be fitted to each female outlet.

The fire service inlets and hydrant outlets shall be of all gunmetal construction except for the handwheel which shall be of cast iron or hard aluminium alloy.

The inlet and outlets fittings shall be supplied and manufactured to the quality of material, construction, and dimensions as detailed in the following British Standard Specification: -

- a) Hydrant assembly to BS 5041 Part 1.
- b) Major valve components of gunmetal to BS EN 1982.
- c) Globe & check valve of service rating 1000 kPa to BS 5154.
- d) Male and female instantaneous terminals of 65 mm diameter to BS 336.
- e) All fittings shall be tested to at least 2000 kPa.

1.2.5.3 Venting and Draining

All hydrant risers shall be supplied and installed with automatic air vents of 25 mm size at the highest points and drain valves at the lowest points of the systems.

1.2.5.4 Pressure Reducing Hydrant Outlets

Pressure reducing hydrant outlet shall be supplied and installed at outlet locations where the static and pump pressure exceeds 700 kPa.

The pressure reducing hydrant outlet shall be in the form of a parity valve incorporated in the hydrant outlet and valve assembly and connected to a drain pipe not less than 40 mm diameter. Alternatively, where specified, the pressure reducing hydrant outlet can be in the form of self-contained type without the use of the parity valve and drain pipe. It shall be capable to reduce the running pressure and satisfy the flow test requirements. The pressure reducing mechanism of the valve shall be located at downstream of the valve seat. Pressure reduction shall be achieved by means of hydraulic pressure balancing with metal diaphragm. An 100% effectiveness pressure reducing performance shall be maintained at all times of operation.

1.2.5.5 Hose Reels

Hose reels shall be of fixed or swing-out type to suit the site installation conditions of the site. The construction, testing, performance, working pressure, etc. shall be to KS Code (2009). The length of hose shall be 30 m and bore 19 mm.

Drums shall be constructed of diecast light alloy, hydraulically balanced, free from denting and twisting, and finished in red enamel. The hub and shaft shall be of brass, fitted with a device to prevent overrun of the hose, having a glandless centre seal.

The entire assembly shall be drip free. Hoses shall be of reinforced rubber or P.V.C. tubing complying with KS Code (2009) and shall be fitted with a copper alloy nozzle having slow closure type lever-operated cock.

A hose guide complete with nylon or similar runners shall be supplied and installed adjacent to fixed type hose reels to enable the hose to be run out in any direction as required.

For the wall fixed pattern, wall-mounting brackets of substantial construction capable of supporting the entire weight of the hose reel and tubing under all operating conditions are required.

For the swing-out pattern, the support brackets and the swing-out arm shall be so designed as to enable the whole hose reel assembly be swung through 180° in a horizontal plan.

Each hose reel nozzle shall be housed inside a glass fronted metal box. The box shall be fabricated from sheet metal not less than 0.8 mm thick with a hinged door with front break glass and padlocking facility. The metal box shall be painted and finished to the satisfaction of the Engineer. The break glass shall be of fragile type not more than 1.5 mm thick. The break glass shall be easily replaced. Common key shall be used for the padlocks. Five common keys shall be provided. A metal or plastic striker

1.2.5.6 Cabinets

Cabinets for the housing of fire service inlets, hydrant outlets and hose reels will be provided by the Building Contractor unless otherwise specified. The Contractor shall furnish all necessary information to enable these cabinets to be designed and constructed including proposed dimensions for the cabinets and the dimensions, weights, etc. of the equipment supplied by him. All information supplied shall be based on BS 5041 Part 4.

Where hose reels are located in cabinets or recesses to which doors are fitted, the doors shall bear the words "FIRE HOSE REEL ()" in both English and Swahili characters prominently and easily identifiable from all lines of sight in the surrounding. In the case of doors which can only be opened by pushing in first, they shall also be annotated "PUSH TO OPEN ()" in both English and Swahili. Hose reel cabinets fitted with doors shall not be locked and shall be easily identified and opened at time of emergency. All doors and markings will be provided by the Building Contractor unless otherwise specified.

1.2.5.7 External Hydrant System

External hydrants shall be of pedestal type manufactured of cast iron. The construction of the street hydrants shall comply with the requirements of KS Code (2009)

The hydrant, when tested in accordance with the provision of BS 1042 with one 65 mm outlet working, shall be capable of delivering not less than 2000 litres per minute (33.3 l/sec.) with a minimum running pressure of 170kPa at the outlet. The minimum output and pressure as stated above shall be made available from two 65 mm outlets of the system delivering at the same time, i.e. a total output of not less than 4000 litres per minutes (66.7 l/sec.) at 170 kPa. Where the minimum standards are not possible from direct town mains, the water supply shall be augmented by water tank and booster pumps. The Contractor shall submit to the Engineer for approval soonest after the test proposal for providing booster pumps and tanks for the street hydrant system if the water supply pressure and flow from town mains are not adequate to meet with the requirements of KS Code (2009)

1.2.6 AUTOMATIC SPRINKLER SYSTEM

1.2.6.1 Standards

Sprinkler system shall be installed in accordance with the following Standards and Requirements:-

- a) The Loss Prevention Council Rules for Automatic Sprinkler Installations and the Technical Bulletins.
- b) Codes of Practice for Minimum Fire Service Installations and Equipment published by the Government of Kenya (KS Code (2009)).

1.2.6.2 Definition of Terms

For the definitions of terms used for sprinkler systems, reference shall be made to the LPC Rules for Sprinkler Installations, and the Code of Practice for

Minimum Fire Service Installations and Equipment published by the Government of Kenya (KS Code (2009)).

1.2.6.3 Types of Systems

Types of sprinkler systems are as defined in the LPC Rules for Sprinkler Installations.

1.2.6.4 Classification of Fire Hazard

The LPC Rules for Sprinkler Installations has defined various classes of fire hazard according to the occupancy of the building to be protected.

1.2.6.5 Grading of Sprinkler Systems

Sprinkler systems are graded according to the number and type of water supplies available. Reference shall be made to the LPC Rules for Sprinkler Installations.

1.2.6.6 Sprinklers

Sprinkler for general application shall be of LPCB approved conventional type or approved by similar widely recognized independent regulatory body. Spray sprinkler shall be used where specified and approved. The sprinkler shall not be altered in any respect nor have any type of ornamentation or coating applied after leaving the production factory. Unless otherwise specified, sprinkler shall be quick response type approved by LPCB or approved by similar widely recognized independent regulatory body. For sprinkler system designed to high hazard group, the sprinkler shall in addition be designed to provide appropriate water droplet sizes for the type of hazard and goods they protected.

Sprinkler shall be constructed with the appropriate characteristics, to suit each particular application. The sprinkler shall be of pendant, upright or side wall type to suit the installation requirements in accordance with the LPC Rules for Sprinkler Installations. Each sprinkler may be defined by any of the following characteristics: -

- a) Nominal Size of the orifice
- b) Type of heat operated element
- c) Operation Temperature
- d) Type of Detector

Unless otherwise specified, glass bulb sprinkler shall be constructed with heat sensitive quartzoid bulb with temperature rating of 68°C. Sprinklers installed in heated rooms e.g. kitchen cooking area, autoclave room, etc. shall have a temperature rating of 93°C unless otherwise specified.

Sprinkler installed at the false ceiling shall be of flush pattern, pendant type and be supplied and installed with an adjustable screw type escutcheon and adaptor to be installed flush with the false ceiling with the yoke and heat sensitive element exposed below the false ceiling line. Sprinkler heads shall be installed at the centre line of the ceiling tiles. The sprinkler head assembly including the yoke arm, escutcheon, adaptor and cover plate installed in exposed locations shall be chromium plated or finished to a polyester white colour or a colour to be approved by the Engineer. The sprinkler head concealed inside false ceiling shall be of natural brass finish or of the same finish as the sprinklers in exposed locations.

The sprinklers shall cover all areas in the sprinkler-protected building including staircases, common corridors and toilets except plant rooms/D.G. stores/cold storage and other special areas that are provided with other fire service systems acceptable to KS Code (2009)

1.2.6.7 Sprinkler Guards

Sprinklers shall be protected by approved metal guards at locations where they are installed at a height less than 2 metres from ground level or liable to accidental or mechanical damage or required by the KS Code (2009). Sprinkler guards shall be made from brass, wax coated or products having equivalent functions and performance for corrosion resistance. It shall be of size not more than 65 mm high.

1.2.6.8 Spacing and Location of Sprinklers

Spacing and location of sprinklers shall be in accordance with the LPC Rules for Sprinkler Installations.

The Contractor shall check the actual site conditions before and during installation works to ensure that the sprinkler installation complies with the LPC Rules for Sprinkler Installations. The Contractor shall inform the Engineer well in advance of any necessary change of pipe sizes or sprinkler layout in order to suit the finished engineering layout. The Contractor shall be held responsible for the taking down and refixing works without charges if he/she fails to check and inform the Engineer in good time about such alterations

The Contractor shall supply and install metal baffles of the correct size between sprinklers wherever required by the LPC Rules for Sprinkler Installations.

1.2.6.9 Spare Sprinklers

The Contractor shall supply and install a cabinet containing a minimum number of spare sprinklers for each type of sprinklers as recommended by the LPC Rules for Sprinkler Installations or as specified. Sprinkler spanners as supplied by the manufacturers of the sprinklers shall also be provided and kept in the cabinet. Where quick response sprinklers or fast response sprinklers are provided in the Works and adequate quantities of spare quick/fast response sprinklers shall be supplied and maintained as recommended by the LPC Rules for Sprinkler Installations or as specified. Where conventional sprinkler heads and quick response / fast response sprinkler heads are provided in an installation, the number of spare sprinklers for each type of sprinkler head shall be considered separately and each shall comply with the recommendation in the LPC Rules for Sprinkler Installations for any hazard class.

1.2.6.10 Pipework Installation

Pipework installation for sprinkler systems shall be installed in accordance with the LPC Rules for Sprinkler Installations and as detailed in Clause 6.2.

1.2.6.11 Pressure Gauges, Valves and Alarm Devices

Pressure gauges, various types of valve and alarm devices shall be installed in accordance with the LPC Rules for Sprinkler Installations.

1.2.6.12 Cabinets for Control Valve Sets and Sprinkler Inlets

Cabinets for housing the sprinkler control valve sets and sprinkler inlets will be provided by the Building Contractor unless otherwise specified. The Contractor shall furnish all necessary dimensional information to enable these cabinets to be designed and constructed.

1.2.6.13 Subsidiary Stop Valves

Electric monitoring type subsidiary stop valves shall give visual signals back to the fire alarm control and indicating panel to indicate the open/close state.

Audible signal shall also be given when the valve is not in fully open position.

1.2.6.14 Sprinkler Control Valve Sets

The control valve set comprising the associated pressure gauges, valves, alarm devices, water motor gongs, testing facilities, retarding chambers, etc. shall be in accordance with the LPC Rules for Sprinkler Installations. Electric monitoring device shall be fitted at each valve to give signals back to the fire

alarm control and indicating panel to indicate the open/close state of the valve. Audible signal shall also be given when the valve is not in fully open position. Drain connection to the system shall be led to conspicuous positions as approved by the Engineer and comply with the requirements of the Water Supplies Department. Sprinkler control valve set shall be of duplicate alarm valve arrangement or of alarm valve with bypass arrangement, and with alarm monitoring facilities.

1.2.6.15 Pre-Action System

Pre-action system shall be supplied and installed where specified. There are two types of pre-action installation as follows:

- a) Type 1, which shall be installed only to prevent a premature discharge of water from pipework or sprinklers that have suffered mechanical damage; and
- b) Type 2, which shall be installed only to facilitate an early discharge of water from a dry pipe installation by opening the installation main control valve, thus filling the installation control pipework with water, upon operation of a fire detection system.

For Type 1 system, the water shall normally flow into the pre-action pipework when the sprinkler is opened and the fire detection system is operated. For Type 2 system, the water shall fill the pre-action system pipework upon operation of a fire detection system before the sprinkler is operated.

Unless otherwise specified, Type 2 shall be used for pre-action system.

The sprinkler installation pipework shall be normally charged with air under pressure, and monitored to give a warning indication on reduction of the air pressure. Complete loss of air pressure shall initiate the visual and audible indications for a fire alarm.

The fire detection system shall automatically give an alarm at the fire alarm control and indicating panel, pre-action system control panel and any repeater panels and shall operate two independent LPCB certified solenoid valves or actuator mechanisms either of which shall release (Type 1 or Type 2) pre-action alarm valves. The solenoid valves or actuator mechanisms may be energised or de-energised to operate a pre-action valve control system.

The pre-action system control panel shall incorporate the necessary relays, timers, key types switches, alarm and trouble lights essential to the operation of the system. The control panel shall employ printed circuit boards for the components and shall be completely factory-wired and ready for connection on site. The control panel shall comply with Section B8 where relevant and the following:

- a) The duration of the battery stand-by power supply shall be at least seventy-two (72) hours. At the end of the 72- hour stand-by period, the stand-by power supply shall be capable of operating the pre-action control panel and solenoid valve or actuator to release the pre-action alarm valve.
- b) The pre-action control panel shall initiate operation of the pre-action alarm valve immediately in the event of a fire alarm system fault (including a failure of the primary and stand-by power supplies) which may result in failure to execute the appropriate actions in the event of fire

The pre-action control panel relays and circuitry operating the pre-action alarm valve solenoid valves or actuator mechanisms shall be duplicated and wired such that no single fault or failure shall render the installation inoperable.

Monitoring devices shall be supplied and installed to give: -

- a) indication that any stop valves down-stream of the installation control valve set are fully open;
- b) audible and visual warnings at the pre-action control panel that any monitored stop valve is not fully open;
- c) audible and visual warnings at the pre-action control panel that the cover to a condition indicator switch has been removed;
- d) audible and visual warnings at the pre-action control panel of short circuit or disconnection of the leads of any solenoid valve or actuator which is energised to open;
- e) audible and visual warnings at the pre-action control panel of short circuit or disconnection of the primary power supply, the secondary power supply or any battery charger associated with the operation of the pre-action system.

The fire detection system used to activate a pre-action sprinkler system shall comply the following: -

- a) Each room or compartment protected by sprinklers shall have sufficient fire detectors to initiate release of the pre-action installation without the operation of any detectors external to the room or compartment or located within equipment.
- b) Fire detection systems employing coincidence connection (requiring a response from two detectors to initiate operation of the pre-action alarm valve) may be used with Type 1 and Type 2 pre-action installations. Consideration shall be given to actuation of the pre-action alarm valve on operation of a single fire detector where fast-developing fires may occur.

- c) Any two detectors of a group of detectors that may initiate the operation of the pre-action alarm valve shall be separately connected to independent wiring circuits (coincidence connection).

Consideration shall be given to the nature of the occupancy, building height, sprinkler thermal sensitivity, air movement and the recommendations of the LPC Rules for Sprinkler Installations

1.2.7 TANKS AND PUMPS

1.2.7.1 Water Tanks

Water tanks forming part of the building construction will be provided by the Building Contractor unless otherwise specified.

Water tanks shall be constructed in compliance with LPC Rules for Sprinkler Installations and the minimum Fire Service Installations and Equipment published by the Government of Kenya.

Puddle flanges for inlet and outlet pipes shall be supplied by the Contractor and installed by the Building Contractor unless otherwise specified. All other piping connections and valves shall be supplied and installed by the Contractor except overflow, drains and inlet piping which will be supplied and installed by Building Contractor unless otherwise specified.

The Contractor shall check the construction drawings for water tanks for fire service installation and verify their correctness for installation purposes, or submit proposals for modification to the design, as necessary, and shall assist in the supervision of their construction, in order to ensure their suitability and proper functioning.

1.2.7.2 Water Pumps

Water pumps for sprinkler systems shall comply with the LPC Rules for Sprinkler Installations. Water pumps for hydrant/hosereel systems shall comply with the KS Code (2009), and BS 5306 Part 1 wherever applicable. Pumps shall be manufactured by a manufacturer possessing certified ISO 9001/9002.

Sprinkler pumps shall be LPCB certified pumps or approved by any similar widely recognised independent regulatory bodies. Test certificate shall be submitted at the time of delivery.

There shall be at least one standby pump in addition to the duty pumps for each pump set. In addition, there shall be at least one jockey pump in each sprinkler pump set.

1.2.7.3 Pump Operation

Pumps with stable characteristics for fire service installation shall be selected to suit the design requirements for capacity (flow rate) as specified and shall discharge at a pressure which shall produce running pressures within the statutory requirements at the location concerned. In addition, the required net positive suction head of the selected pumps shall be compatible with the available net positive suction head in the installations. The design figures given on the Particular Specification and/or drawings are for guidance only. No adjustment in cost will be entertained if the actual required duty points (pressure and flow rate) are different from the specified figures. Close valve total pressure head shall not exceed 140% of the rated head.

The Contractor shall be responsible for carrying out a final accurate calculation of operating heads based upon the characteristics of the pipework systems including fittings, equipment and accessories as actually installed by him. Certified performance curves for the pumps shall be provided with the operating range clearly indicated.

Pump drive motor output power shall be rated to give 20% for hydrant system and 10% for sprinkler system more power in addition to the hydraulic power required for the rated flow of the system. Pump speed shall not exceed 50 rps.

Pumps shall be capable of running under conditions of zero or low "draw-off" continuously without overheating. This may be achieved either by pump design or by an automatic by-pass circuit arrangement. Details of this shall be shown on the Contractor's Installation Drawings. Overheat alarm devices may be supplied and installed if necessary but these shall not be arranged to shut down the pump automatically.

Pumps shall have acceptable low noise level and good energy efficiency to the approval of the Engineer especially for the jockey pumps.

1.2.7.4 Pump Construction

Pumps shall be of centrifugal, horizontal end suction type unless otherwise specified having casings of close-grained grey cast iron to BS 1452 Grade 180.

Horizontal split casing pump or multi-stage centrifugal pump shall be supplied and installed in lieu of the end suction type if necessary or as specified.

Flanges shall be to BS 4504 PN16. Impellers shall be of stainless steel to BS 970 Part 1 Grade 316S31. Shaft shall be of stainless steel to BS 970 Part 1 Grade 316S31 statically and dynamically balanced after assembly. Impeller rings shall be of cast iron and renewable secured from relative movement by stainless steel end rotation ring.

Salt water pumps if specified shall be generally of the similar type and construction to the fresh water pump, and the impellers and shafts shall be of stainless steel to BS 970 Part 1 Grade 316S31.

Pump seals shall be of the stuffing box gland type of appropriate depth to prevent leakage. Low pressure stuffing boxes shall be water sealed to prevent air leakage. Glands shall be of cast iron or bronze.

Bearings shall be of ball or roller type having an adequate safety factor to ensure long life. Housings shall be easily removable for servicing.

Grease nipples shall be provided on the pump casing adjacent to each bearing for lubrication of the bearings.

1.2.7.5 Pump Set Installation

The pump and motor shall be directly coupled and mounted on a substantial machined base plate of cast iron or of fabricated mild steel. Couplings shall be flexible of steel pin and synthetic rubber bushing type, accurately aligned, and fitted with guards.

Pumps shall be complete with all necessary water seal connections, vents, drains and priming plugs, and all installation materials including foundation bolts and anti-vibration mountings. Drain pipework shall be of copper and shall run to a nearby drain gully or as specified. Automatic priming equipment shall be included where necessary to ensure that the pumps are primed at all times.

The exposed shafts, couplings and moving parts of pumps shall be provided with suitable galvanised iron mesh guards coated with primers and finishing paint and shall be stoutly constructed and easily removable complete with lifting handles.

Each pump shall be provided with pressure gauges installed to indicate the suction and discharge pressure. The gauges shall be neatly mounted on a rigid wooden or metal board adjacent to the pump or rigidly fixed in-line with suction and discharge pipework. Suitable permanent labels in English and Swahili shall be affixed for each gauge to indicate its function.

Duty/standby selector, manual start/stop buttons, voltmeters, ammeters, high/low level alarm, and associated indications shall be supplied and installed at the starter panel inside the pump room. Except the manual stop buttons, similar provisions shall also be supplied and installed at the main and/or repeating fire alarm control and indicating panels as specified in the Particular Specification. A lock-off type emergency stop shall be supplied and installed adjacent to each pump set. Visual and audible indication shall be provided on the pump control panel indicating the pump is stopped and locked by the emergency stop and shall remain on until the emergency stop is reset.

Except for the proprietary package pump set and proprietary starter panel complying with KS Code (2009) and with ISO 9001/9002 quality system, the starter panel shall be made from minimum 1.6 mm thick stainless steel to BS 970 Part 1 Grade 316S31.

The pumps shall be actuated at the pump room and the fire alarm control and indicating panel.

1.2.7.6 Maintenance Facilities

Pump installation shall be complete with adequate facilities for maintenance and future replacement of base plate. Lifting eyes shall normally be provided upon pumps, motors, and engines. Details of any requirements for overhead run-ways, hoists, etc., required for installation and maintenance shall be submitted to the Engineer for approval. Where there is a Building Contractor carrying out the building work for a particular project, the overhead run-ways, hoists and hoisting beam will be carried out in the building work by the Building Contractor provided that the Contractor shall submit in good time to the Engineer for approval, full details of such requirements, so that due consideration may be given before the Building Contractor commences work in the areas concerned. Where there is no Building Contractor, all facilities for maintenance shall be supplied and installed by the Contractor.

1.2.7.7 Motors for Pump Drives

Electric motor for pump drives shall be of the drip proof or totally enclosed fan-cooled (TEFC) squirrel cage induction motor to BS 4999 and BS 5000 Part 10 with Class F insulation. Drip proof motors shall be fitted internally with an anti-condensation heater of single phase pattern arranged so that the heater will be switched off automatically when the motor is started and switched on automatically after stopping.

Totally enclosed fan-cooled motors shall be dust and moisture protected to IP 54. In damp situations or in underground pump houses, motor terminal boxes shall be of weather-proof type. The power factor of the motor shall not be less than 0.85 lagging under all normal operating conditions. Noise level of all

motors shall be in accordance with or better than the recommendation of BS EN 60034-9 and shall comply with Environmental Protection Department's requirements. Motor and pump shall be properly balanced and aligned to avoid excessive vibration.

1.2.7.8 Motor Starting

The method of motor starting shall be selected according to the characteristics of the pump and shall comply with the KPLC limitations on starting current. The type of starter shall be as follows, unless otherwise specified: -

Condition 1: For supply arrangement from KPLC's overhead line

Up to 3.8 kW	Direct-on-line
3.8 kW to 22 kW	Star/delta
Above 22 kW	Automatic-transformer 60% tapping or star/delta

Condition 2: For supply arrangement from KPLC's non-overhead line system

Up to 11 kW	Direct-on-line
11 kW to 25 kW	Star/delta
Above 25 kW	Automatic-transformer 65% tapping or star/delta

1.2.7.9 Starters

Starters shall be air break triple pole electromagnetic contactor type and shall comply with and be tested to BS EN 60947-4-1. Any no-volt release mechanism must be of the automatic resetting type such that on the restoration of the supply the motor can restart automatically. Magnetic and thermal overload trips are not allowed. A phase failure protective device shall be incorporated. Utilization category shall be AC-3 of intermittent duty Class 0.1, 60% on-load factor. Each starter shall comprise on/off controls and indications.

Starters shall be supplied and installed complete with enclosures except where required to be mounted upon composite control panels and shall be in accordance with BS EN 60947-4-1. Enclosure shall provide protection of person against contact with live or moving parts inside the enclosure, protection against ingress of dust and liquid and protection against mechanical damage in accordance with BS EN 60947-1, BS EN

Star/delta and auto-transformer starters shall have approved timers for automatic transition, calibrated and adjustable.

All components shall be of non-hygroscopic, non-corroding material and tropicalized.

Operating coils shall be wound on nylon or similar and vacuum impregnated with nonorganic varnish or plastic encapsulated.

1.2.7.10 Pump Set Isolation Mountings

Unless otherwise approved by the Engineer, motor driven pump set shall be mounted upon a common base plate supported by approved spring-type isolation mountings on concrete plinth. Where package fire pump set is specified, the fire pump, motor, couplings, controls, etc. shall be pre-assembled on the common base plate with spring type isolation mountings by manufacturer in a factory possessing ISO 9001/9002 quality system.

1.2.7.11 Jockey Pumps

Jockey pumps complete with TEFC driven motor for maintaining hydraulic pressure shall be of the multi-stage horizontal or vertical centrifugal type having construction generally in compliance with Sections B4.5 and B4.8 with stainless steel shaft and impellers. Alternatively, reciprocating pumps capable of performing the same duty may be acceptable. Reciprocating pumps shall be with stainless steel piston rod and piston, synthetic rubber seals and oil bath lubrication, mounted on a common base plate with the electric motor drive.

1.2.7.12 Factory Test and Certification

All sprinkler pumps before delivery shall be factory tested and certified on the performance. A factory test certificate and record shall be submitted. Where the manufacturer does not have an approved test facilities required by LPCB for the test in the factory, the Contractor shall, before delivery, arrange the test to be carried out by an independent testing organization approved by LPCB or approved by any similar widely recognised independent regulatory body acceptable to the Engineer.

Site test shall not be accepted as a substitute for the factory test.

Package fire pump set shall be factory tested and certified similar to the sprinkler pump. Where specified, factory test and certification shall be required for other pumps similar to the sprinkler pump.

1.2.8 GASEOUS EXTINGUISHING SYSTEM

1.2.8.1 General

The Contractor shall be responsible for the design of the gaseous extinguishing system. Unless otherwise specified, gaseous extinguishing systems shall be of

the total flooding type with pressurized open-ended piping installation on the distribution side. The automatic gas release mechanism shall be operated by means of fire detection units at the protected compartment or manually by a pull handle or push button as described below. Design the gaseous extinguishing system to comply with the standards published by National Fire Protection Association or internationally recognised equivalent standards, and demonstrated to be equivalent in terms of the type of construction, functions, performance, general appearance and standard of quality of manufacture and approved by the Engineer. All proprietary design details from the manufacturer shall be submitted to the Engineer and complying with KS Code (2009).

Carbon dioxide system shall be designed and installed in accordance with either BS 5306 Part 4 or NFPA 12 and shall only be used in normally unoccupied areas where egress of personnel can be accomplished in thirty (30) seconds.

Other gaseous systems shall be of clean agent type and designed and installed in accordance with NFPA 2001 or any recognised system design manual prepared by the manufacturer.

Unless otherwise specified or approved by the Engineer, the clean agent used shall be FM200. For application in areas with high ceiling height or with low temperature or with limitation in storage spaces for the clean agent that makes the use of FM200 unsuitable, other clean agents such as FE13, FIC, etc. to the approval of the Engineer will be considered. Other clean agents may require additional submission, tests and other information required by the KS Code (2009). The Contractor shall deem to allow the cost for all such submissions, requirements and tests to the satisfaction and compliance with KS Code (2009) and the Engineer when other clean agents are used.

The entire gaseous extinguishing system shall be a proprietary product certified by LPCB, UL or FM and has been approved by KeBS. All components of the installation shall be compatible with the design of the system. Any add-on device shall be approved by the system manufacturer and shall not affect the proper functioning of the system.

1.2.8.2 Quality of Extinguishing Agents

Carbon dioxide used shall be of good commercial grade, free of water and other contaminants that might cause container corrosion or interfere with free discharge through nozzle orifices. In general, carbon dioxide obtained by converting dry ice to liquid will not be acceptable. The vapour phase shall not be less than 99.5% purity with no detectable off-taste or odour. The water content of the liquid phase shall not be more than 0.01% by weight. Oil content shall not be more than 10 ppm by weight.

Other clean agent gases shall comply with NFPA 2001, in particular, the acute toxicity, the ozone depletion potential and global warming potential.

1.2.8.3 Performance of Standard Total Flooding Installation

Carbon dioxide total flooding systems shall be designed to achieve the necessary concentration, rate of application and duration to maintain the extinguishing concentration all as specified in BS 5306 Part 4 or NFPA 12 in accordance with the volume, hazard and environmental conditions of the protected enclosures. Unless otherwise specified, the rate of application in general shall comply with following requirements: -

- a) For surface fires, the design concentration shall be achieved within one (1) minute.
- b) For deep-seated fires, the design concentration shall be achieved within 7 minutes but the rate shall not be less than that required to develop a concentration of 30% in two (2) minutes.

Other clean agent gas flooding systems shall be designed to achieve an acceptable concentration stipulated in NFPA 2001 or any recognised system design manual from the manufacturer at room temperature complying with KS Code (2009). Discharge of gas shall be substantially completed within ten (10) seconds and following discharge the concentration of clean agent shall develop throughout the protected compartment to achieve final extinguishments of fire within sixty (60) seconds.

1.2.8.4 Contractor's Responsibility for System Performance

The compartment to be protected and the location of the gas cylinders shall be as indicated on the Contract Drawings. The layout of pipework and nozzles shown on the Contract Drawing is indicative. The Contractor is responsible for the design of the complete system in co-ordination with other services.

Notwithstanding that the Contractor has demonstrated by calculation to the satisfaction of the Engineer that the system will perform to the standard required, the Contractor shall remain responsible for ensuring that under test the system does in fact perform in accordance with the Specification.

1.2.8.5 Contractor to Provide a Complete Working System

The Contractor shall supply and install all components necessary for full operation of the system in the automatic or manual mode regardless of whether such components are specified or not.

1.2.8.6 Gas Storage Pressure

All the gas extinguishing agents shall be stored in rechargeable cylinders to hold the pressurized agents in liquid form at ambient temperature. The Contractor shall select cylinders of commonly available sizes and types that can be recharged. The Contractor shall allow for at least 10% spare capacity in sizing of each cylinder.

For high pressure system, carbon dioxide shall be pressurized to a corresponding nominal pressure of 5860 kPa at 21°C. The normal filling density shall not be in excess of 68%. For low pressure system, carbon dioxide shall be kept at the design pressure of 2068 kPa by refrigeration system. The refrigerants in the refrigeration system shall have zero ozone depletion potential. Appropriate alarm and pressure relief shall be supplied and installed to cater for possible failure of the refrigeration system. Unless otherwise specified, carbon dioxide system shall be of high pressure system.

Clean agent cylinders shall be charged in accordance with NFPA 2001 or any recognised system design manual from the manufacturer.

Gas cylinders, distribution pipework, valves, nozzles and fittings shall be manufactured to standards designed to withstand the maximum pressure of stored agent allowing for variations in ambient temperature.

The gas cylinders shall be certified for the intended gas storage pressure and use and complying with KS Code (2009) Part S.

1.2.8.7 Gas Cylinders

Carbon dioxide cylinders shall be of seamless steel construction to BS 5045 Part 1. For low pressure refrigerated system, it shall be in accordance with the manufacturer's design and certified by recognised bodies such as LPCB, UL, FM or approved by any similar widely recognised independent regulatory body acceptable by the Engineer and complying with KS Code (2009) Part S.

Clean agent cylinders shall be constructed in accordance with NFPA 2001.

Cylinders shall be securely mounted in a frame bolted to the wall and to be so arranged that the external parts may be readily inspected and corrosion cannot occur. Each cylinder shall be fitted with an automatic pressure release device for over pressure protection of the cylinder.

Each cylinder shall be complete with gas valve, actuator, pressure gauge, flexible hose, check valve and all other necessary accessories. Where the cylinder of a proprietary system complying with KS Code (2009) Part S is not fitted with a pressure gauge, the Contractor shall supply and install pressure gauge in the system pipework for each cylinder.

A device shall be supplied and installed for measuring the amount of liquid in the cylinder at any time. This shall be done by a method which does not require the cylinder to be detached from the manifold. If a weighing device of the type that requires suspension is proposed, means shall be supplied and installed above each cylinder for the attachment of the weighing device. The contents of the cylinders may alternatively be checked by the use of a liquid level indicator of a type approved by the Engineer.

The liquid shall be discharged from the cylinder through a siphon tube. The pressure of the liquid stored in the cylinder shall be such that freezing cannot take place at the lowest possible ambient temperature.

Means shall be supplied and installed to prevent gas discharging into empty containers and to prevent loss if the gas is released when any of the cylinders is disconnected.

Gas cylinders shall be painted signal red as specified in BS 381C in accordance with the requirements of BS 5252. The cylinder shall be free from all rust and corrosion before painting is applied. The type of extinguishing agent, the tare weight, gross weight, liquid level at 21°C and also the degree of super pressurisation (for clean agent) where applicable shall be clearly painted on each cylinder with white paint.

Gas cylinders shall be of rechargeable and re-usable types. If the discharge of gas will require the irreversible rupture of any component of the system such that they are not reusable, the Contractor shall provide one spare set of such components for each installed cylinder. They shall be stored in a labelled and locked cabinet inside the gas cylinder room. Three keys shall be provided.

Only gaseous extinguishing systems that can be recharged locally and the refilling of gas after discharge can be accomplished within a short time shall be approved and used.

The Contractor shall submit details of the refilling arrangement including agency, address of local workshop, refilling time, etc. together with the equipment submission to the Engineer for approval. Equipment submission without details on the refilling arrangement shall not be approved.

The Contractor shall supply and install facilities to isolate or to lock the gas cylinders during routine maintenance or inspection work on the gas cylinders and control system in order to prevent accidental discharge of gas. The facilities shall give appropriate warning indication when it is switched to the 'isolated' mode.

1.2.8.8 Fire Detection and System Control - Automatic Release

Fire detection in the protected area shall be by means of smoke or heat detectors as specified. Sufficient detectors shall be supplied and installed to give duplicate coverage of the whole of the protected area and connected in cross-zones.

Activation of a detector on one zone shall cause alarm bells to sound. Activation of detectors on two zones shall cause a siren or an approved horn to sound and red or amber flashlights in the protected area to light warning that the extinguishing agent is about to be discharged if the system is in the automatic mode. These warning signals will also be activated by the operation of the manual release before the discharge.

The gas extinguishing control panel shall control and monitor the gas release system.

It shall include an automatic/manual lock-off unit controlled by key switches at each entrance to the protected area. Any one key switch shall be capable of switching the system on or off. The manual release mechanism will remain operative whether the system is on or off. A time delay unit which is adjustable in the range of 15 to 30 seconds shall be supplied and installed. Relays shall be supplied and installed to shut down ventilation and air-conditioning, to close openings and to switch off equipment as necessary. These relays will operate immediately when two zones of the fire detection system are activated or when the manual release is operated. Release of the gas will follow after the pre-set time delay.

The gas extinguishing control panel shall comply with Clause 7.8 where relevant and with battery backup. The battery supply shall be able to actuate the system at the end of the standby period.

1.2.8.9 Manual Release

A manual release unit shall be supplied and installed in a suitable position outside each entrance to the protected compartment. The manual release unit shall consist of a pull handle or push button mounted in a box with "break glass" cover. The box shall be so designed that its glass front may be readily replaced and that its front cover can be opened with a key for the purpose of operating the switch without breaking the glass.

1.2.8.10 Emergency Release

An emergency release handle with direct mechanism shall be supplied and installed in an accessible position at or near the gas cylinders. The emergency release shall require no power supply to operate and it shall be supplied and installed with a removable pin to prevent accidental release of gas. Provision shall be made for operation of the emergency release to activate the relays to

cause simultaneous shutdown of ventilation, air-conditioning, equipment etc. and to sound the alarm.

1.2.8.11 Gas Release Mechanism

The operation of the gas release mechanism shall require minimum power from an external electrical, pneumatic or mechanical source and shall preferably be operated by a falling weight device. No springs shall be used in any position where their failure or fracture would prevent the correct operation of the gas release mechanism or cause the inadvertent release of the gas.

All release devices and mechanisms shall be designed for the working conditions they will encounter and shall not readily be rendered inoperative or susceptible to accidental operation. They shall have proper protection from mechanical, chemical or other damage that would render them inoperative.

1.2.8.12 Gas Distribution System

All pipework shall be non-combustible and able to withstand the expected pressures and temperatures without damage. Specification of materials and installation shall conform to the relevant international standards for the respective gas extinguishing agent used.

Other standards adopted for proprietary systems that are in compliance with KS Code (2009) Part S can also be used when approved by the Engineer.

Pipes up to 100 mm shall be screwed and socketed, pipework over 100 mm shall use screwed flanges.

Threaded steel pipework and fittings shall be free of burrs and rust and shall be galvanised inside and outside. Screwed threads shall conform to the dimensions specified in BS 21. Screwed joints shall be made with P.T.F.E. tape or products having equivalent functions and performance but chemically inert to the extinguishing agent used. Compressed fibre gaskets free of asbestos shall be used for flange joints.

Pipe work shall be painted signal red as specified and illustrated in BS 381C in accordance with the requirements of BS 5252. Brass fittings shall be left unpainted.

1.2.8.13 Gas Discharge System to be Securely Fixed and Guarded

The gas discharge system including cylinders, pipework and nozzles shall be securely fixed to the structure with correctly spaced saddles or brackets in accordance with KS Code (2009) Part S Requirements and Circular Letters. All components shall remain in place when subjected to the pressures and forces

produced during discharge. Fixings shall allow for movement due to thermal expansion.

The system shall be guarded so that the operation of any moving parts shall not be obstructed.

1.2.8.14 Indicator Lights, Warning Notices and Labels

All gas storage compartments and compartments protected by a gas extinguishing system shall have a warning notice fixed on each entrance door to the compartment.

The notice shall be made of sheet metal plate not less than 1.6 mm thick or of material approved by the Engineer.

The manual/automatic lock off key switches, the manual release units and the emergency release handle shall all be labelled in English and Swahili so that it is clear what their purpose is and how to operate them.

1.2.8.15 System Odoriser

Odorisers where specified shall be capable of automatically treating the gas after releasing from the cylinder and shall be of citrus odour type, so that hazardous atmosphere can be recognised at once. Where odorisers are installed, a suitable notice to the effect that anyone detecting the citrus odour should leave the area immediately and report the occurrence to a responsible person. The notice shall be worded in English and Swahili.

1.2.9 MISCELLANEOUS

1.2.9.1 Labels and Notices

Labels and notices shall be supplied and installed for all pumps, valves, switches, gauges, indicators, cables, internal wiring terminals and all other equipment to facilitate operation and proper maintenance of the fire service installation. All labels shall make cross reference to the operation and maintenance manuals and as-built drawings

Labels and notices required by statutory requirements shall be inscribed accordingly whereas other labels shall indicate name and purpose of the equipment together with ratings and commissioned set values where applicable.

Labels for equipment identifications shall be made of red plastic material or multilayer formica with white lettering or as approved. Lettering shall be

engraved on the plastic material or formica. All wording shall be in both Swahili and English. All labels shall be of adequate size as to give clearance between lettering and fixings to ensure an aesthetic arrangement on completion.

Notices for safety warning and instructions shall be constructed of heavy gauge aluminium sheets painted with symbols or wording as appropriate.

Notice for instruction for operation and use of the equipment shall be provided as appropriate and necessary. Instructions for use shall be provided to all equipment for use by the general public and for operation by the operating staff.

Labels and notices shall be fixed by screws. Where drilling and tapping is impracticable, approved adhesive may be used subject to prior approval by the Architect. For pipelines or valves, where applicable, labels shall be fixed by means of a key ring attached to the upper corner of the pipe mounting bracket or the hand wheel of valves. The labels shall be suspended from brass or stainless steel chain loops over the relevant pipe.

All major fire service equipment and components such as pumps and motors, flow switches, alarm valves, expansion joints, pipes and fittings, etc. shall have factory applied permanent nameplates indicating, where relevant: -

- a) Name of Manufacturer.
- b) Model.
- c) Serial Number.
- d) Design Flow Rate, Pressure, etc.
- e) Rated Duty.
- f) Operating Voltage, Phase, Ampere, and Frequency.
- g) Full Load Current and Power.
- h) Starting Method and Current.
- i) Power Factor.
- j) Date of Manufacture.
- k) IEC, British Standards or other Authorities' markings to indicate their compliance and grades of application.
- l) Any other necessary data to conform to specified requirements and to indicate the equipment performance.

Instructions for oiling and/or greasing of all fans, motors, etc. shall be attached to the relevant greasing or oiling points.

Where the equipment has an operating life less than or equal to ten (10) years, the expiry date or the 'end of service life' date has to be stated on the label attached to the equipment. Labels of approved types shall be supplied and installed for fire extinguishers, fixed sprayer units, batteries, detectors and gas

extinguishing system showing the expiry date of design operating life. Unless otherwise barcode labels are provided, the label shall have a serial number of the equipment and the serial number shall be recorded on the as-built drawings.

Identification to the approval of the Engineer shall be supplied and installed for emergency luminaires of the same appearance as other non-emergency luminaires for quick identification in routine inspection.

All isolators and protective devices that can isolate the supply to the fire alarm system shall be properly labelled to the approval of the Engineer.

1.2.9.2 Danger Notices

Danger notices worded: DANGER-PLANT ON AUTOMATIC START (-) in English and Swahili shall be supplied and installed adjacent to all automatically controlled motor-driven and engine-driven pumps.

Notices, instructions of use complying with the requirements of Labour Department and Occupational Safety and Health Ordinance, Chapter 509, shall be supplied and installed.

1.2.9.3 Painting, Finishing, Protection and Identification

Painting shall follow General Specification for Building unless otherwise specified. Paint all surfaces including cable trunking/conduit, panel, box, enclosure, cladding, pipework, equipment, fitting, etc. except otherwise specified.

Self-finished surfaces like stainless steel, anodised aluminium, chrome plated, bronze, plastic, etc. are not required to be painted.

Galvanised pipework concealed in false ceiling or galvanised duct not normally accessible and/or seen need not be painted unless otherwise specified, but appropriate colour code indication shall be applied.

Equipment with factory applied paints or epoxy coatings need not be painted.

Painting and coatings for the purpose of protecting the materials from corrosion including those inside concealed spaces shall be required.

All surfaces, unless otherwise specified, shall be finished in first class paint work. All metallic surfaces shall be wire-brushed and cleaned to make it free from rust, scale, dirt and grease prior to painting. All work shall be carried out by qualified tradesmen. Water based paints with reduced volatile and preservative content or paints with reduced solvent content formulated for minimal volatile organic compound emissions complying with reputable international standards shall be used in occupied areas. In addition, all paints

shall contain no mercury, lead, hexavalent chromium or cadmium compounds. All painting works shall be completed and left in ventilated environment for at least 1 week, or the curing period recommended by the paint manufacturer whichever is longer, before occupation or handover of the renovated area to minimize volatile organic compound exposure.

All surfaces shall be painted and finished as specified in the Particular Specification to meet and match the aesthetic Architectural design as required.

Painting shall be of approved type and shall be generally to CP (prepared by the PM), and should include but not limited to the following: -

- a) Do not carry out painting work in wet, humid or foggy weather or on surface that is not thoroughly dry or if there is excessive dust in the air.
- b) Ensure that all holes, cracks and other defects in surface have been made good prior to painting.
- c) Ensure the surface is thoroughly clean and dry prior to painting. Loose material shall be removed by dry brushing with stiff broom or brush.
- d) Keep surface clean and free from dust during coating and drying.
- e) Protection freshly applied surface coating from damage.

Primer shall be applied to metal surface before the application of under and finishing coats of paint. Primer for non- galvanised metal surface shall be metallic zinc-rich primer to BS 4652, Type 2, and for galvanised surface shall be calcium plumbate primer or approved etch primer. Bare copper tubing shall be polished bright and coated with approved heat resisting clear synthetic varnish. All surfaces shall receive one primer coat, one under coat and 2 finishing coats.

The primer, under coat and finishing coat of paint shall be from the same manufacturer. The painting procedure shall be strictly in accordance with the manufacturer's instruction.

For anti-corrosion paint and primer, the correct type of thinner/ activator shall be used and the mixing method shall follow the manufacturer's instructions.

Colour of the finishing coats shall be to the approval of the Engineer. Pipes and pipelines shall be complete with the identification colour code indicators when the colour of the finishing coat is not in accordance with ISO 3864.

The street hydrant body shall be painted red if it is connected to fresh water supply and painted yellow if it is connected to salt water supply. If the street hydrant is removed from service, the blank cap shall be painted blue.

Copper pipes and fittings shall be polished bright by sanding, wiped with mineral spirits and coated with an approved heat resisting clear synthetic varnish.

Where normal painting is not practicable, all possible measures to prevent corrosion to the plant shall be applied such as special protective coverings, special anti-corrosive paints, etc. as recommended by the supplier or specified in the Particular Specification

For temporary protection, all stainless steel parts shall be covered with PVC wrapper or tape until handover. All ferrous parts shall be painted or greased (whichever is most suitable). All bright parts (chrome plates, polished stainless steel or aluminium, etc.) which are liable to deterioration shall be covered with tallow or a suitable protective coating during the progress of work. Upon completion of work, the protection coating shall be removed and the parts polished as appropriate. Any damage to the primer or protective coatings shall be made good. When it is necessary to remove, or partly remove the protection for installation or making connections, the Contractor shall ensure that the standard of protection provided originally is re-applied at the earliest possible time. All plants, pipes valves, and fittings shall be, as far as possible, thoroughly cleaned and cleared of rust and other foreign matters both before erection and before subjection to pressure tests. For temperature and/or humidity sensitive electrical or electronic control panels and equipment, the Contractor shall where necessary protect them against high humidity and/or temperature by operating portable or temporary dehumidifiers and/or air conditioners in the enclosures containing this equipment. In order to protect the equipment against dust infiltration, the Contractor shall store them in a dust free room or enclose them in heavy duty PVC sheets or bags. Where necessary, filters shall be provided in the temporary air conditioning systems.

1.2.9.4 Spares and Tools

For plant and/or equipment included in the Contract, the Contractor shall provide the types of spare parts generally wherever these are appropriate to the plant and/or equipment involved plus any additional items for the particular plant and/or equipment. Unless specified in detail, the criteria by which the Contractor shall judge the need for spare parts to be included shall be any part or component of the plant or equipment that is subject to frictional wear, vibration or temperature fatigue, rupture to safety (or otherwise), corrosion, erosion, decay, limited operating life, unacceptable deposits and/or saturation, normal fair wear and tear and is likely to fail or reach an unacceptably low performance level.

The Contractor shall provide sets of spare parts and special tools including spare sprinkler heads, detectors, replacement break glass plates, indicator lamps, special keys, fuses, parts for the gas extinguishing system after discharge, etc. as required by the statutory rules, for one year operation and maintenance after expiry of the Maintenance Period, and as required by other parts of this General Specification at the time of completion of the Works and before commencement of the Maintenance Period. The Contractor shall

supply and install locked cabinet or cabinets in the plant room(s) and/or control room(s) for housing the spares and tools. Such sets of spare parts and special tools shall be submitted to the Engineer for approval within four (4) months after commencement of the Contract, or in such period as has been agreed by the Engineer in writing.

The Contractor shall also supply all the spare parts and special tools required for the whole Maintenance Period for operation and maintenance of the plant and installation. The spare parts and special tools shall be in addition to the requirements in the second paragraph of this section. At the end of the Maintenance Period, the Contractor shall ensure that the spare parts and special tools required in the second paragraph of this section are provided and stored in the cabinet.

The Contractor shall replenish and supply spare parts that may have been used during the Maintenance Period.

In addition, the Contractor shall include in the operation and maintenance manual a complete manufacturer's recommended list of all the replaceable parts, spares and special tools with model number, part number and price which are likely to prove necessary to service the plant and/or equipment. The list shall be complete with prices and the prices listed shall be fixed and open for acceptance up to the end of the Maintenance Period. The list shall include diagrams or catalogue details of the parts concerned and bona fide manufacturer's published price lists. The Contractor may add the net shipping costs for each item plus a 15% margin to cover overheads and profit. Where appropriate, the prevailing exchange rate must be stated.

The Contractor shall submit information on the design operating life for equipment such as batteries, detectors, fire extinguishers, gas extinguishing system, etc. that are required to be replaced some years later. The Contractor shall provide three keys for each key operating facilities, locks and switches unless otherwise specified.

1.2.9.5 Provision for Water Meter

Metering of water supplies to fire service installation is not required. Provision shall, however, be made for the possible future connection of the Water Supplies Department meter at each point of connection to the main, immediately downstream of the main stop valve. The position of this future meter shall be shown on the installation drawings. The Contractor shall co-ordinate with the Building Contractor to obtain the information where necessary.

1.2.9.6 Noise and Vibration

The Contractor shall take all necessary steps to prevent the transmission of any objectionable noise and vibration which affects the occupied areas of the building.

Pumps and motors shall be balanced and aligned such that the measured vibration velocity at all three axis shall not exceed 1.8 mm/s rms in the range of 10 to 1000 Hz as defined in BS 4675, ISO 2954 and ISO 10814.

Motor driven pump set shall be mounted upon a common base plate supported by approved spring-type isolation mountings on concrete plinth.

Flexible connectors shall be installed at pump connections to take up vibration. Unless otherwise specified, flexible connector of single sphere or double sphere type made from rubber and similar materials shall not be used. Flexible connector shall be used to absorb the vibration and shall not be used to take care of the misalignment during installation. All pumps and pipes shall be properly aligned on completion

Pumps shall be of low noise rating especially for the jockey pump set and other equipment requiring frequent operation. Acoustic treatment shall be provided as necessary and approved by the Engineer.

Acoustic treatment shall be provided to the emergency generator installation and other fire service installations and equipment to comply with statutory requirements on noise and vibration.

1.2.9.7 Equipment Bases

All bases and supports for plant and equipment shall be supplied and installed by the Contractor, except concrete plinths and blocks, which will be provided by the Building Contractor unless otherwise specified but shall be designed by the Contractor to suit the actual equipment.

Plinths and blocks shall be designed to project approximately 100 mm above the finished floor level.

1.2.9.8 Safety Facilities

Facilities for operational and maintenance safety shall be supplied and installed to comply with the Occupational Safety and Health Ordinance and with the requirements of Labour Department. All moving parts shall be appropriately covered and emergency stops shall be supplied and installed where necessary.

Adequate spaces and facilities shall be allowed for maintenance and access.

1.2.9.9 Schematic Diagram and Key Layout Drawings

Schematic diagrams and where relevant key layout drawings shall be provided to all major plant rooms and fire service control rooms. The

diagrams and drawings shall be mounted in glazed frames and installed in appropriate locations in the rooms

1.2.10 COMMISSIONING AND ACCEPTANCE TEST

1.2.10.1 Adjustments, Commissioning, Functional and Performance Tests

The Contractor shall commission the installation and carry out complete functional and performance tests for all equipment and systems installed by him/her or them, make all necessary adjustments, including setting all controls and checking the operation of all protective and safety devices in accordance with the manufacturers' instructions, the requirements of the statutory rules and regulations and to the satisfaction of the Engineer before the installations will be accepted. Prior to any tests, the Contractor shall submit detailed commissioning and testing procedures, methods, format of test records and a programme for the commissioning and testing to the Engineer for approval at least three (3) months before commencement of commissioning and testing or within four (4) months after commencement of the Contract whichever is earlier. They shall be updated as the work progresses towards completion. All commissioning and testing procedures for works that are required to be tested during construction shall be submitted in good time for approval.

The detailed procedures submitted shall follow Testing & Commissioning Procedures submitted by the Engineer with additional details and tests proposed by the Contractor to the approval of the Engineer and in accordance with the manufacturer's recommendation, relevant standards and statutory regulations. Detailed commissioning and testing procedures shall be submitted for all special systems and systems. The detailed procedures shall be prepared in two main parts covering the following: -

- a) Testing that is required to be carried out during the construction period when part of the Works is installed.
- b) Commissioning and testing required for certifying completion of the Works and before commencement of the Maintenance Period.

Immediately after each test, the Contractor's Commissioning Authority, herein referred to as "CCA" shall sign the data record sheet on site with endorsement by the Engineer's representative witnessing the test, irrespective whether the test is successful or not, and submit a copy of the data record sheet to the Engineer. For testing that is required to be carried out during the construction period, the Contractor shall submit a formal commissioning and testing report or certificate for each test and endorsed by the Contractor's CCA within fourteen (14) calendar days after the test.

Commissioning and testing shall include, but not limited to: -

- a) Factory tests and off-site tests.
- b) Visual inspection and checking.
- c) Setting to work, safety and quality tests.
- d) Commissioning, regulations, tuning and adjustment
- e) Functional tests.
- f) Performance tests.
- g) Final mock-up tests.
- h) Statutory tests and inspections.

Visual inspection and checking shall include verification of the installed equipment being the approved models. The Contractor shall submit relevant documents including delivery orders and payment vouchers to substantiate the equipment installed on site being the approved models if the identification of the manufacturer and model name cannot be seen easily on site.

The Contractor shall note that completion of commissioning and testing and the associated statutory inspection by the local authority is one of the considerations for certifying completion of the Works. The Contractor shall make a detailed plan on the programme of the commissioning and testing works at the commencement of the Contract, in order to ensure that all of such works can be completed within the Contract period. The commissioning and testing programme submitted shall detail the types of commissioning and testing works required, the breaking down of the programme into floor-by-floor and area-by-area basis, the tests that are required during construction and at the time before the completion of the Works, the period of tests with float time allowed, the milestone dates on connection of fire alarm direct link, final mock-up test and statutory/licensing inspections, and the programme for the completion of various builder's works such as pump rooms, control rooms, water supply, electrical supply, etc. The Contractor shall in particular plan the programme so as to minimize the overlapping of different tests arranged simultaneously in different locations.

The Contractor shall arrange to enable the Engineer or the Engineer's representatives to witness all the commissioning and testing. Unless otherwise approved by the Engineer, commissioning and testing carried out by the Contractor in the absence of the Engineer or the Engineer's representatives shall not be accepted. The Contractor shall give at least 72 hours' notice, in writing, when any part or parts of the installation will be tested.

Any defects of workmanship, materials and performance, maladjustments or other irregularities which become apparent during commissioning and testing shall be rectified by the Contractor at no additional cost to the Employer and the relevant part of the commissioning or testing procedure shall be repeated at the Contractor's expenses

If considered appropriate, the Contractor shall be required to carry out demonstration to dismantle those parts/components of the installation which are considered difficult/impossible for maintenance access. The Contractor shall be responsible for carrying out all necessary modification work at no extra charge to the Employer to alleviate the difficulties associated with dismantling or maintenance access.

The Contractor shall not wait for completion of every part of the work but shall arrange for a progressive commissioning programme to achieve practical overall completion and have the whole work ready to be handed over by a date to suit the Contract completion date or any other agreed programme date.

1.2.10.2 Factory Tests and Off-site Tests

Factory test shall deem to be included. Factory test and off-site tests shall be carried out at the manufacturer's works or by an approved independent testing body/laboratory where specified, or elsewhere as approved. Where indicated, 'type-tests' on items of equipment to demonstrate compliance shall be carried out. 'Type-tests' certificates shall be submitted in duplicate to the Engineer. Factory quality and general inspection test recommended by the manufacturer shall be required. Where indicated or necessary, factory performance test shall be carried out for each of the offered equipment before delivery. Factory test certificate certified by qualified factory engineer shall be submitted in duplicate to the Engineer for approval. This approval shall normally be required before the materials or equipment are dispatched from the manufacturer's works. Factory test shall be witnessed by an independent approved agency where indicated.

The Contractor shall note that the Engineer may require witnessing tests and inspections of manufactured equipment during construction at the manufacturer's works. Where this requirement is indicated in the Contract, the Contractor shall allow for making the necessary arrangements.

1.2.10.3 Visual Inspection and Checking

Site inspections of 'work in progress' will be made by the Engineer or the representative from time to time. The Contractor shall keep such inspection record for checking from time to time. Works to be permanently covered up shall be subjected to inspection, pressure test and other tests before cover up. During the inspection, if the Engineer discovers any work that has been covered up before inspection and testing, this work shall be uncovered for inspection and testing to the Engineer's satisfaction. The cost involved in uncovering the work, inspecting, testing and re-concealing the work together with any consequential losses shall be paid by the Contractor at no additional cost to the Employer. Any defective works and installation of poor workmanship found during visual inspection shall be rectified or replaced before proceeding with further tests.

1.2.10.4 Setting to Work, Safety and Quality tests

Prior to any commissioning and testing works, the Contractor shall check the completion of the works, the associated builder's work, the related fire services provisions and the associated building services installations, to ensure that commissioning can be proceeded without obstruction.

Before any installation is subjected to commissioning and site testing, it shall be thoroughly cleaned both internally and externally.

The Contractor shall be responsible for initially setting the plants to work including: -

- a) Preliminary checks to ensure that all systems and system components are in a satisfactory and safe condition before start up.
- b) Preliminary adjustment and setting of all plant and equipment consistent with eventual design performance.
- c) Carrying out pressure test, hydraulic test and other tests required before energizing the equipment and plant.
- d) Checking the proper functioning of the protective devices and safety valves in the installation and carrying out all necessary safety testing.
- e) Energizing and setting to work on all plants.
- f) Initial regulation and demonstration that the installation delivers the correct rate of flow at the conditions specified in the Contract.

The Contractor shall arrange for any specialist plant or equipment to be commissioned and tested by the specialist equipment manufacturer's skilled commissioning engineer and/or technician.

1.2.10.5 Commissioning, Regulations, Tuning and Adjustment

The Contractor shall regulate, balance, tune, commission and adjust the installation and equipment as appropriate and necessary to deliver the conditions and requirements specified in the Contract. The Contractor shall allow carrying out such adjustment and re-adjustment as necessary until all the requirements are met and the installation is accepted by the Engineer.

1.2.10.6 Functional Tests

The Contractor shall demonstrate to the satisfaction of the Engineer the functioning of the installation, system and equipment complying with the operational and functional intent and the requirements in the Contract. The Contractor shall demonstrate and test the proper operational mode, control and the sequence of the operation in various parts of the system and installation.

1.2.10.7 Performance Tests

The Contractor shall carry out tests to prove the performance of the installation, system and equipment in term of flow, pressure, current, sound level, and other technical/design aspects complying with the requirements in the Contract and the statutory requirements. The Contractor shall regulate, balance, tune, adjust and modify the installation, system and equipment as necessary till the performance requirements are met. The final setting and operational parameters of all equipment shall be recorded.

Where necessary, the Contractor shall carry out full load test by simulation or other approved method to prove the performance of the installation at full load condition.

1.2.10.8 Labour and Materials

The Contractor shall dispatch competent and experienced commissioning engineers and technicians to carry out the commissioning and testing of the installation. All labour and materials necessary for carrying out the work shall be provided by the Contractor, except that the Building Contractor will supply electricity and water as required unless otherwise specified. The Contractor shall supply any necessary diesel, gas or other fuel oil for engine-driven pumps and generators provided in the Works, sufficient gases required for the discharge tests of the gaseous extinguishing system installations, etc.

The Contractor shall employ a competent and experienced commissioning engineer in-charge (hereinafter referred as CEIC) approved by the Engineer to be responsible for the overall arrangement, co-ordination, supervision and certification of the commissioning and testing of all fire service installations and equipment. The CEIC shall have minimum 5 years on site experience for similar type and scale of commissioning and testing works. The CEIC shall be responsible for the submission of detailed commissioning and testing methodologies and procedures, co-ordination of the programme and sequence of commissioning and testing works, arranging the test and re-test of the installations, supervising the commissioning and testing works, and certifying results of the tests. The CEIC shall lead and co-ordinate the final mock-up test as well as the statutory inspection with the local administrative authority. The Contractor shall submit details of CEIC together with the commissioning and testing programme to the Engineer for approval.

The Contractor shall replenish all fire extinguishing media and other materials expended or used during the test and ensure that the entire installation is in "as new" condition at the conclusion of the tests.

The Contractor shall properly drain the water and exhaust the gas during and after the test as required. The Contractor shall provide and adopt measures to avoid damage to the building, installations, decorations and fixtures during the tests for any fixed fire service installations and equipment.

1.2.10.9 Water System Tests

Water systems and circuits shall be tested hydraulically to a minimum pressure of 1000 kPa or 1.5 times the working pressure whichever is higher applied at the highest point of the system and held for a period of not less than 15 min without leaks appearing. All pipework shall be thoroughly cleaned and flushed before test. The Contractor shall ascertain that there is adequate drainage nearby to discharge by large hose in order to ensure flooding of low level areas will not occur. Where necessary, the Contractor shall provide chemical cleaning to the pipes. After flushing out the pipework, a flow test shall be performed on the hydrant/hose reel system in accordance with the requirements of the Code of Practice for Minimum Fire Service Installations and Equipment.

A water supply test with the drain and test valves fully opened shall be made on the sprinkler system in accordance with the requirements of the LPC Rules for Sprinkler Installations. An alarm test for at least thirty (30) seconds on the water gong shall also be carried out by opening the test valve to ensure that it shall sound continuously after water flow in the system is detected. All controls and air supply system for the pre-action system, recycling pre-action system and dry pipe system shall be tested.

An actual water discharge test shall be performed on the drencher/deluge/water spray/water mist system and where required for other automatic fixed installations using water to test the water flow and discharge pattern of the nozzles.

For street hydrant system without pumps, the Contractor shall test the incoming water supply pressure at a nearby supply point and at such time as agreed with the Engineer before the completion of the installation to establish the adequacy of the water supply pressure. If the supply pressure is inadequate, the Contractor shall propose remedial measures for the approval of the Engineer. The Contractor shall find and select the most appropriate nearby supply point for the test.

The Contractor shall provide whatever hoses or drainage channels required to safely removing the test water discharged while carrying out these tests in order to ensure that no damage to the building and property will be caused by the test water.

The Contractor shall submit hydraulic test certificates/reports that shall be signed by the Contractor's CEIC and by the Engineer or the representative who has witnessed the test. The test certificates/reports shall contain the following particulars: -

- Date of test
- Apparatus or section under test
- Makers number (if any)

- Nature, duration and conditions of test
- Result of test
 - Name of Contractor's representative (in block letter) in charge of test
- Name of Employer's representative at witness the test

1.2.10.10 Gaseous Extinguishing System Tests

Gaseous extinguishing system and manifolds shall be tested in accordance with Section 7.6 and SABS Requirements and Circular Letters. Pipework shall be tested for ten (10) minutes to a minimum of 1.5 times the operating pressure of the system and 10 bars whichever is larger. A 'puff' test(s) to the installed pipework is required.

The Contractor shall refill the gas cylinders with the design agents and reset all equipment after the discharge test.

1.2.10.11 Final Mock-Up Test

Before arranging statutory inspections with Local Fire Department and an Independent Commissioning Authority (CA), the Contractor shall arrange a final mock- up test with the Engineer to demonstrate all the items required for the statutory inspections have been completed and tested to the satisfaction of the Engineer.

Before the final mock- up test, the Contractor shall ensure that all documents required for statutory inspections shall be available on site.

Further mock-up tests shall be required if the installation fails to meet with the satisfaction of the Engineer in the test. The Contractor shall not arrange inspection with local fire departments till the satisfactory acceptance of the mock- up test by the Engineer. The Contractor shall allow adequate time in the commissioning and testing programme for re-testing of the system in case of failure. The Contractor shall indicate the mock- up test and the inspection by local fire department as the milestone events in the critical path programme to be submitted to the Engineer at the commencement of the Works.

1.2.10.12 Commissioning and Testing Report and Certificate of Completion

All commissioning and testing results shall be properly recorded during commissioning and testing at the witness of the Engineer. Immediately after the commissioning and testing, the Contractor's CEIC shall endorse the data record sheet on site with endorsement by the Engineer's representative witnessing the commissioning and testing, irrespective whether the tests are successful or not, and submit a copy of the data record sheet to the Engineer. A full commissioning and testing report shall be forwarded to the Engineer

within fourteen (14) calendar days after completion of commissioning and testing of the installation.

1.2.10.13 Completion of Outstanding Works

Within one month of receiving the Engineer's substantial completion certificate, the Contractor shall complete all outstanding works listed thereon and rectify any defects that have arisen up to that time.

1.2.11 GENERAL MAINTENANCE REQUIREMENTS

The Contractor shall furnish free maintenance services for the complete fire service installation for the whole Maintenance Period unless otherwise specified. This free maintenance services shall include the following: -

- a) Routine quarterly inspections, tests and maintenance services, and routine inspections, tests and maintenance service as necessary.
- b) Emergency inspections, tests and repairs.
- c) Final inspections, tests and maintenance services, and annual inspections, tests and maintenance services.

All inspections, tests, maintenance services and repairs shall be carried out generally in accordance with the manufacturers' recommendations/instructions and to the satisfaction of the Engineer. The maintenance service is to maintain the fire service installation in a good and functional working condition. The maintenance service shall include preventive maintenance and all spare parts and spares required in the Maintenance Period.

The Contractor shall dispatch competent and experienced engineers and technicians equipped with the appropriate testing instruments, tools, equipment, etc. to inspect, service, test, adjust and maintain the fire service installation in a satisfactory operating condition. The Contractor shall allow for carrying out such inspection, service, testing, adjustment and maintenance at a time outside normal office hours including general holidays where and when required. The Contractor shall submit a list with at least two names, telephone and pager numbers and addresses of the Contractor's English- speaking and Cantonese- speaking representative to who services calls should be directed.

Particularly in the case of complex fire service installation, the Contractor shall provide at least two senior servicemen being thoroughly familiarized with all aspects of such installation to be responsible for inspection, maintenance and testing of the installation. In this type of installation, the Contractor must be prepared to provide a high level of service, allowing for more frequent service of environmentally sensitive equipment and when necessary, to ensure prompt

rectification of the faults resulting in unacceptably high rate of unwanted alarms all at the expenses of the Contractor.

All labour and materials necessary, e.g. fire alarm contacts, detectors, bells, buzzers, lamp bulbs, etc., including cleaning materials, lubricants, battery electrolyte, tools, instruments, replacement of parts, etc., and transportation required for carrying out routine and emergency inspections, tests, repairs, replacements and maintenance services shall be included in the Contract. Any renewals or repairs necessitated by reason of negligence or misuse of the equipment or by reason of any other cause beyond the Contractor's control (with the exception of ordinary wear and tear) shall be carried out at an additional cost with prior notice to the Engineer. The Contractor shall also replenish at the Contractor's own cost all fire extinguishing media and other materials expended or used during the tests including diesel or petrol fuel and ensure that the entire installations are in a satisfactory operational condition at the conclusion of each visit.

The Contractor shall be responsible for all repairs necessary to maintain the fire service installation in a safe, reliable and operative condition at all times. The Contractor must ensure that the Contractor's servicing staff shall carry out the necessary repairs by utilizing manufacturer's original replacement parts. Any component taken down for services shall be reinstated within two (2) hours or otherwise replaced by a spare unit at the Contractor's expenses.

The Contractor shall ensure minimum interruption to the functioning of the fire service installation during each inspection, testing, repair or maintenance service. Where any part of the fire service installation is out of service temporarily during the progress of work, the Contractor shall place a suitable notice in a prominent position on the control panel so that the client is aware of the situation and the local fire department will not be called out unnecessarily. This is, however, not to be construed as an authority to leave any part inoperative for an undue length of time.

The Contractor shall, as and when instructed by the Engineer, repair or replace at the Contractor's own cost any part of the system proved to be defective by reason of Contractor's negligence, faulty design, inadequate routine maintenance and supervision, workmanship or materials. No claim whatsoever shall be made by the Contractor for such repair or replacement if it is within the scope of the Contractor's responsibility.

After each routine quarterly inspection, testing and maintenance service, the Contractor shall furnish to the Engineer within fourteen (14) calendar days a report complete with the following details: -

- a) Date and time of inspection, testing and maintenance service.
- b) Persons carrying out the task.
- c) Details of inspection and maintenance service.
- d) Results of all tests performed.

- e) Any external factors significantly affecting the service and test results.
- f) Any follow-up actions as required.
- g) The record of the fire alarm direct link being temporarily disconnected since last routine quarterly inspection with date and time.

The Contractor shall, at the Contractor's own expenses, make all suitable arrangements to avoid damage to property or installations provided by others during the course of the Works. The Contractor shall be responsible for all losses and claims for injury or damage to any person or property arises out of or in consequence of the execution of the maintenance work.

1.2.12 EMERGENCY INSPECTIONS, TESTS AND REPAIRS

Emergency service including overtime work for minor repairs and adjustments shall be included under the Contract.

The Contractor shall be responsible for immediate answering of breakdown calls during the day or night including public holidays, whether true or false, and attention to such calls both inside and outside the normal working hours in the shortest possible time and using the quickest means of transport. In general, a response time of less than one (1) hour will be expected unless special arrangement is made and approved for very remote locations.

Any necessary repairs shall be carried out with the most practicably expeditious means to ensure minimum interruption to the operation of the fire service installation.

The Contractor shall arrange to refill the gas cylinders for the gaseous extinguishing system upon discharge and put the system into normal operation within a time as short as possible but in no case shall be longer than seven (7) calendar days. Unless otherwise there are evidences that the discharge of gases in the gaseous extinguishing systems is due to a fire, smoke that generated a fire alarm, or the default operation/act of the occupiers of the building, the cost for refilling the gas cylinders of the gaseous extinguishing systems after discharge in the Maintenance Period shall be borne by the Contractor.

The Contractor shall keep a clear and legible record of all fault callouts and shall submit this record within three (3) calendar days upon request by the Engineer for inspection. The Contractor shall also include the record of all fault callouts in the report in Section C2.1 submitted after each routine quarterly inspection, testing and maintenance service. The record shall indicate the date, time of callout, time of attending, persons attending, brief description of the fault, location/identification of fault, cause of fault, and subsequent time of

clearance for each occasion. The record will be returned to the Contractor after perusal by the Engineer but shall subsequently be submitted and kept by the Engineer at the end of the Maintenance Period during the handover inspection of the installation.

1.2.13 CERTIFICATE OF MAINTENANCE

After completion of the final inspection, testing and maintenance service to the fire service installation at the end of the Maintenance Period to the satisfaction of the Engineer, the Contractor shall within fourteen (14) calendar days issue to the Engineer a certificate of maintenance signed by the Contractor with a copy forwarded to the Director of Fire Services. Where the Maintenance Period is longer than one year, the Contractor shall also submit to the Engineer a certificate of maintenance after the completion of the annual inspection, testing and maintenance to the satisfaction of the Engineer with a copy forwarded to the Director of Fire Services in compliance with the requirements of local fire department.

1.2.14 HANDOVER OF FIRE SERVICE INSTALLATION

The fire service installation shall not deem as acceptable for handover to the Engineer until the installation is in good working order and all as-built drawings, instruction and maintenance manuals, spare parts lists, test reports, test certificates, etc. have been submitted to the Engineer.

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.0	<u>PRELIMINARIES & CONDITIONS OF CONTRACT</u>				
1.1	Allow for mobilization, tools and all necessary equipment on site	1	Item		
1.2	Allow for co-ordination of works with the Main Contractor and other Sub-contractors	1	Item		
1.3	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	1	Item		
1.4	Arrangement for all factory inspections and tests that may be required by the Project Engineers/Client and shall provide all instruments and equipment required for these tests.	4	Item		
1.5	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	1	Item		
1.6	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works.	1	Item		
1.7	Allow for on-site Training of the Operators for specialised equipment	1	Item		
1.8	Allow for all the preliminaries relating to this contract as specified	1	Item		
1.9	Allow for city council water connection & borehole meter connection	1	Item		
Total Carried to BQ Main Summary Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
2.0	<u>Internal Foul Drainage</u>				
	Supply and fix the following uPVC, Soil and waste system to BS4514 with fittings fixed to manufactures printed instructions and BS5572-1978 as described and manufactured by reputable manufacturers. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system.				
	Note				
	All UPVC branches, tees, reducing branches, reducing tees, reducers, etc. are to be formed in strict accordance with the manufacturer's instructions as required for the satisfactory functioning of the system.				
2.1	Pipe Works				
2.1.1	uPVC 32Ø	250	m		
2.1.2	Ditto 40Ø	750	m		
2.1.3	Ditto 50Ø	1670	m		
2.1.4	Ditto 63Ø	850	m		
2.1.5	Ditto 75Ø	950	m		
2.1.6	Ditto 110Ø	1850	m		
2.1.7	Ditto 150Ø	2000	m		
Total Carried to Internal Foul Drainage Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
2.2	45° Bends				
2.2.1	uPVC 40Ø	150	No.		
2.2.2	Ditto 50Ø	130	No.		
2.2.3	Ditto 75Ø	110	No.		
2.2.4	Ditto 110Ø	400	No.		
2.2.5	Ditto 150Ø	300	No.		
2.3	88.5° Bends				
2.3.1	uPVC 50Ø	100	No.		
2.3.2	Ditto 63Ø	70	No.		
2.3.3	Ditto 75Ø	120	No.		
2.3.4	Ditto 110Ø	165	No.		
2.3.5	Ditto 150Ø	100	No.		
2.4	45° Bends long				
2.4.1	uPVC 75Ø	70	No.		
2.4.2	Ditto 110Ø	110	No.		
2.5	90° Bends (Long Radius)				
2.5.1	uPVC 32Ø	60	No.		
2.5.2	Ditto 40Ø	95	No.		
2.5.3	Ditto 50Ø	110	No.		

Total Carried to Internal Foul Drainage Collection Page No. 8

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
2.5.5	Ditto 75Ø	90	No.		
2.5.6	Ditto 110Ø	280	No.		
2.5.7	Ditto 150Ø	300	No.		
2.9	45° Equal Tees				
2.9.1	uPVC 32Ø x 32Ø	100	No.		
2.9.2	Ditto 40Ø x 40Ø	122	No.		
2.9.3	Ditto 50Ø x 50Ø	180	No.		
2.9.4	Ditto 63Ø x 63Ø	70	No.		
2.9.5	Ditto 75Ø x 75Ø	80	No.		
2.9.6	Ditto 110Ø x 110Ø	180	No.		
2.9.7	Ditto 160Ø x 160Ø	90	No.		
2.10	45° Unequal Tees				
2.10.1	uPVC 40Ø x 32Ø	118	No.		
2.10.2	Ditto 50Ø x 40Ø	148	No.		
2.10.3	Ditto 63Ø x 50Ø	68	No.		
2.10.4	Ditto 75Ø x 40Ø	67	No.		
2.10.5	Ditto 75Ø x 50Ø	65	No.		
2.10.6	Ditto 75Ø x 63Ø	50	No.		
Total Carried to Internal Foul Drainage Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
2.10.7	Ditto 110Ø x 40Ø	90	No.		
2.10.8	Ditto 110Ø x 50Ø	85	No.		
2.10.9	Ditto 110Ø x 75Ø	45	No.		
2.10.10	Ditto 160Ø x 75Ø	110	No.		
2.10.11	Ditto 160Ø x 110Ø	250	No.		
2.11	88.5° Equal Tees				
2.11.1	uPVC 32Ø x 32Ø	58	No.		
2.11.2	Ditto 40Ø x 40Ø	81	No.		
2.11.3	Ditto 50Ø x 50Ø	96	No.		
2.11.4	Ditto 63Ø x 63Ø	60	No.		
2.11.5	Ditto 75Ø x 75Ø	85	No.		
2.11.6	Ditto 110Ø x 110Ø	140	No.		
2.11.7	Ditto 150Ø x 150Ø	98	No.		
2.12	88.5° Unequal Tees				
2.12.1	uPVC 40Ø x 32Ø	65	No.		
2.12.2	Ditto 50Ø x 40Ø	115	No.		
2.12.3	Ditto 63Ø x 40Ø	86	No.		
2.12.4	Ditto 63Ø x 50Ø	84	No.		
2.12.5	Ditto 75Ø x 40Ø	68	No.		
Total Carried to Internal Foul Drainage Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
2.12.6	Ditto 75Ø x 50Ø	88	No.		
2.12.7	Ditto 110Ø x 40Ø	50	No.		
2.12.8	Ditto 110Ø x 50Ø	76	No.		
2.12.9	Ditto 110Ø x 75Ø	67	No.		
2.12.10	Ditto 160Ø x 110Ø	96	No.		
2.16	Reducers				
2.16.1	uPVC 50Ø x 40Ø	98	No.		
2.16.2	Ditto 63Ø x 40Ø	57	No.		
2.16.3	Ditto 63Ø x 50Ø	68	No.		
2.16.4	Ditto 75Ø x 40Ø	83	No.		
2.16.5	Ditto 75Ø x 50Ø	91	No.		
2.16.6	Ditto 75Ø x 63Ø	48	No.		
2.16.7	Ditto 110Ø x 40Ø	64	No.		
2.16.8	Ditto 110Ø x 50Ø	80	No.		
2.16.9	Ditto 110Ø x 63Ø	50	No.		
2.16.10	Ditto 110Ø x 75Ø	65	No.		
2.16.11	Ditto 160Ø x 75Ø	90	No.		
2.16.12	Ditto 160Ø x 110Ø	94	No.		
2.17	Air Admittance Valve				
2.17.1	50Ø	56	No.		
Total Carried to Internal Foul Drainage Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
2.17.1	100Ø	45	No.		
2.18	Floor Traps 100 x 50 x 40 mm diameter 4-way Plastic floor trap as ACO model or approved equivalent complete with top sections & grating.				
2.18.1	100Ø	249	No.		
	Manholes 600 by 600 mm				
2.18.2	Concrete works including benching Double sealed access cover 600 by 600mm	130	No.		
2.19	300 x 300 Gulley Trap	87	No.		
2.20	100Ø uPVC Vent Cowl	61	No.		
2.21	Access caps				
2.21.1	uPVC 50Ø	94	No.		
2.21.2	uPVC 75Ø	125	No.		
2.21.3	uPVC 100Ø	148	No.		
2.21.3	uPVC 150Ø	150	No.		

Total Carried to Internal Foul Drainage Collection Page

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ITEM	DESCRIPTION	AMOUNT (KSH)
	<u>Internal Foul Drainage Collection Page</u>	
1	Total Brought Forward from BQ Pg. 2	
2	Total Brought Forward from BQ Pg. 3	
3	Total Brought Forward from BQ Pg. 4	
4	Total Brought Forward from BQ Pg. 5	
5	Total Brought Forward from BQ Pg. 6	
6	Total Brought Forward from BQ Pg. 7	
Total Carried to BQ Main Summary Page		

ITEM	DESCRIPTION			AMOUNT (KSH)
3.0	<u>ROOF DRAINAGE SYSTEM</u>			
3.1	Roof/Balcony Outlets Supply, Install & Commission Diecast gravity Roof/Balcony rainwater outlets manufactured in accordance with EN 1253-2 as ACO model or approved equivalent. The outlet should come with related fittings including grating/screen.			
3.1.1	100Ø	240	No.	
3.2	Rainwater Drain Pipes Supply, Install and commission PVC-U rainwater downpipes manufactured in accordance to EN 1452 including all range piping, fittings, hangers and support brackets.			
3.2.1	Ditto 75Ø	350	m	
3.2.2	Ditto 100Ø	850	m	
3.3.1	Ditto 150Ø	800	m	
Total Carried to BQ Main Summary Page				

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
4.0	<u>Internal Cold Water Supply System</u>				
	Supply and fix the following in PP-R water pipes to EN ISO 15874-2, DIN 8077/8, with fittings fixed to manufacturer's printed instructions. Tenderers must allow in their pipework, and also where stated for pipes clips or holder bats, plugged and screwed. As Astral or equal and approved				
	Note				
	All PP-R branches, tees, reducing branches, reducing tees, reducers, adapters etc. are to be formed in strict accordance with the manufacturer's instructions as required for the satisfactory functioning of the system.				
4.1	Pipe Works				
4.1.1	PP-R 20Ø	780	m		
4.1.2	Ditto 25Ø	1188	m		
4.1.3	Ditto 32Ø	889	m		
4.1.4	Ditto 40Ø	823	m		
4.1.5	Ditto 50Ø	581	m		
4.1.6	Ditto 63Ø	556	m		
4.1.7	Ditto 80Ø	206	m		
4.2	Coupler				
4.2.1	PP-R 25Ø	330	No.		
4.2.2	Ditto 32Ø	120	No.		
Total Carried to Internal Cold Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
4.2.3	Ditto 40Ø	149	No.		
4.2.4	Ditto 50Ø	139	No.		
4.2.5	Ditto 63Ø	98	No.		
4.2.6	Ditto 75Ø	94	No.		
4.2.7	Ditto 100Ø	36	No.		
4.3	Elbow 45°/90°				
4.3.1	PP-R 25Ø	1002	No.		
4.3.2	Ditto 32Ø	753	No.		
4.3.3	Ditto 40Ø	256	No.		
4.3.4	Ditto 50Ø	203	No.		
4.3.5	Ditto 63Ø	107	No.		
4.3.6	Ditto 75Ø	48	No.		
4.3.7	Ditto 100Ø	36	No.		
4.4	Equal Tee				
4.4.1	PP-R 25Ø	285	No.		
4.4.2	Ditto 32Ø	302	No.		
4.4.3	Ditto 63Ø	62	No.		
4.4.4	Ditto 75Ø	10	No.		
4.4.5	Ditto 100Ø	19	No.		
4.5	Reducers				
4.5.1	PP-R 25Ø x 20Ø	302	No.		
Total Carried to Internal Cold Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
4.5.2	Ditto 40Ø x 32Ø	98	No.		
4.5.3	Ditto 50Ø x 40Ø	62	No.		
4.5.4	Ditto 63Ø x 50Ø	48	No.		
4.5.5	Ditto 75Ø x 63Ø	62	No.		
4.5.6	Ditto 100Ø x 75Ø	12	No.		
4.6	Reducing Tees				
4.6.1	PPR 25Ø x 20Ø x 25Ø	86	No.		
4.6.2	Ditto 32Ø x 25Ø x 32Ø	123	No.		
4.6.3	Ditto 40Ø x 32Ø x 40Ø	26	No.		
4.6.4	Ditto 50Ø x 40Ø x 50Ø	20	No.		
4.6.5	Ditto 63Ø x 50Ø x 63Ø	10	No.		
4.7	Pipe Plug (Plastic)				
4.7.1	Ditto 32Ø	170	No.		
4.8	Adapter Union (Plastic)				
4.8.1	PP-R 40Ø	106	No.		
4.8.2	PP-R 50Ø	112	No.		
4.8.3	PP-R 63Ø	56	No.		
4.9	Female Elbow Adapter				
4.9.1	20Ø x ½"	100	No.		
4.9.2	32Ø x 1"	20	No.		
Total Carried to Internal Cold Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
4.10	Shut off Angle Valve				
4.10.1	Supply & Install 1/2"x1/2" angle valve as PEX-233-CP model or approved equivalent.	270	No.		
4.11	Isolation Valves				
	Supply and Install brass Isolation valves as PEGLER model or approved equivalent.				
4.11.1	Isolation valves 32Ø	28	No.		
4.11.2	Isolation valves 40Ø	50	No.		
4.11.3	Isolation valves 63Ø	20	No.		
4.11.4	Isolation valves 100Ø	8	No.		
	Check Valve				
4.11.5	63Ø	4	No.		
4.12	Flexing Tubes				
	1/2" diameter x 300mm long flexible connectors for connecting the sanitary fittings To be as YORKE- VBC450S or approved equivalent				
4.12.1		289	No.		
4.13	Water Meter				
4.13.1	Supply, Install and Commission Water Meter to the engineer's approval. 63Ø	4	No.		
Total Carried to Internal Cold Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
<p>4.14</p> <p>4.14.1</p> <p>4.14.2</p>	<p><u>WATER TANKS</u> Pressed steel water storage tanks consisting of mass produced pressed steel panels bolted</p> <p>Roof Storage Tank of 6000 x 6000 x 2000 mm (H) to BS 4360 Grade 43A, as made by Steel Structures. The tank to be complete with the following:-</p> <p>a. Flanged 100mmØ inlet pipe connection; b. 100mmØ flanged outlet pipe connectors; c. 100mmØ tank drain pipe connection; d. 100mm Ø flanged overflow pipe connection; e. Manhole and cover with mosquito proof mesh.</p> <p>Treated Water Tank of 6000 x 6000 x 2000 mm (H) to BS 4360 Grade 43A, as made by Steel Structures. The tank to be complete with the following:-</p> <p>a. Flanged 100mmØ inlet pipe connection; b. 100mmØ flanged outlet pipe connectors; c. 100mmØ tank drain pipe connection; d. 100mm Ø flanged overflow pipe connection; e. Manhole and cover with mosquito proof mesh.</p>	<p></p> <p>2</p> <p>1</p>	<p></p> <p>No.</p> <p>No.</p>	<p></p> <p></p> <p></p>	<p></p> <p></p> <p></p>
<p>Total Carried to Internal Cold Water Supply Collection Page</p>					<p></p>

ITEM	DESCRIPTION	AMOUNT (KSH)
<u>Internal Cold Water Supply Collection Page</u>		
1	Total Brought Forward from BQ Pg. 10	
2	Total Brought Forward from BQ Pg. 11	
3	Total Brought Forward from BQ Pg. 12	
4	Total Brought Forward from BQ Pg. 13	
4	Total Brought Forward from BQ Pg. 14	
Total Carried to Main Summary Page		

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.0	<p><u>Internal Hot Water Supply System</u></p> <p>Supply and fix the following in PPRC (Glass Fibre Reinforced PP-R) water pipes to EN ISO 15874-2, DIN 8077/8, minimum PN16 with fittings fixed to manufacturer's printed instructions. Tenderers must allow in their pipework, and also where stated for pipes clips or holder bats, plugged and screwed.</p> <hr/> <p>Note</p> <p>All PPRC branches, tees, reducing branches, reducing tees, reducers, adapters etc. are to be formed in strict accordance with the manufacturer's instructions as required for the satisfactory functioning of the system.</p>				
5.1	Pipe Works				
5.1.1	PPRC 20Ø	450	m		
5.1.2	Ditto 25Ø	690	m		
5.1.3	Ditto 32Ø	541	m		
5.1.4	Ditto 40Ø	483	m		
5.1.5	Ditto 50Ø	300	m		
5.1.6	Ditto 63Ø	363	m		
5.1.7	Ditto 80Ø	146	m		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.2	Coupler				
5.2.1	PPRC 20Ø	113	No.		
5.2.2	Ditto 25Ø	156	No.		
5.2.3	Ditto 32Ø	118	No.		
5.2.4	Ditto 40Ø	125	No.		
5.2.5	Ditto 50Ø	77	No.		
5.2.6	Ditto 63Ø	65	No.		
5.2.7	Ditto 80Ø	96	No.		
5.3	Elbow 45°/ 90°				
5.3.1	PP-R 20Ø	232	No.		
5.3.2	Ditto 25Ø	543	No.		
5.3.3	Ditto 32Ø	297	No.		
5.3.4	Ditto 32Ø	256	No.		
5.3.5	Ditto 32Ø	317	No.		
5.3.6	Ditto 63Ø	38	No.		
5.3.7	Ditto 80Ø	21	No.		
5.4	Equal Tee				
5.4.1	PP-R 25Ø	198	No.		
5.4.2	Ditto 32Ø	242	No.		
5.4.3	Ditto 63Ø	62	No.		
5.4.4	Ditto 80Ø	48	No.		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.4.5	Ditto 100Ø	21	No.		
5.5	Reducers				
5.5.1	PP-R 25Ø x 20Ø	219	No.		
5.5.2	Ditto 40Ø x 32Ø	98	No.		
5.5.3	Ditto 50Ø x 40Ø	62	No.		
5.5.4	Ditto 63Ø x 50Ø	48	No.		
5.5.5	Ditto 80Ø x 63Ø	62	No.		
5.5.6	Ditto 100Ø x 80Ø	12	No.		
5.6	Reducing Tees				
5.6.1	PPR 25Ø x 20Ø x 25Ø	86	No.		
5.6.2	Ditto 32Ø x 25Ø x 32Ø	123	No.		
5.6.3	Ditto 40Ø x 32Ø x 40Ø	26	No.		
5.6.4	Ditto 50Ø x 40Ø x 50Ø	20	No.		
5.6.5	Ditto 63Ø x 50Ø x 63Ø	10	No.		
5.7	Pipe Plug (Plastic)				
5.7.1	25Ø	170	No.		
5.8	Adapter Union (Plastic)				
5.8.1	PP-R 40Ø	18	No.		
5.8.2	PP-R 50Ø	38	No.		
5.8.3	PP-R 63Ø	22	No.		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.9	Female Elbow Adapter				
5.9.1	20Ø x ½"	289	No.		
5.9.2	32Ø x 1"	58	No.		
5.10	Shut off Angle Valve				
5.10.1	Supply & Install 1/2"x1/2" angle valve as PEX-233-CP model or approved equivalent.	289	No.		
5.11	Isolation Valves				
	Supply and Install brass Isolation valves as PEGLER model or approved equivalent.				
5.11.1	Isolation valves 32Ø	32	No.		
5.11.2	Isolation valves 40Ø	14	No.		
5.11.3	Isolation valves 63Ø	20	No.		
5.12	Check Valve				
5.12.1	63Ø	2	No.		
5.13	Flexing Tubes				
5.13.1	1/2" diameter x 300mm long flexible connectors for connecting the sanitary fittings To be as YORKE- VBC450S or approved equivalent	289	No.		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.2.1.0	Hot Water Pipework Insulation Supply and Install Flexible Elastomeric Insulation according to specifications for hot water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.2.1.2	Ditto 25Ø	759	m		
5.2.1.3	Ditto 32Ø	595	m		
5.2.1.4	Ditto 40Ø	531	m		
5.2.1.5	Ditto 50Ø	330	m		
5.2.1.6	Ditto 63Ø	399	m		
5.2.1.7	Ditto 80Ø	161	m		
5.14	Solar Water Heating Collectors Supply, install, test and commission Solar Panels 2.48m ² (as Kodsan, calpak, heliodyne or equal and approved equivalent) complete with 5mm thick toughened tempered glass, 18 copper risers, brass coated threaded fittings, Aluminium Frame profile and a PUF 50mm rock wool insulation, glass with magnification, Brilliance rating, Solar key mark, TUV standards certificate, with mounting frame for sloped roof. Each set of 16 panels to have/share 1 x 100L expansion tank included in the price.	78	No.		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.15	Solar Hot Water Storage Tanks				
5.15.1	Supply, install, test and commission Single heat exchange serpentine thermal tanks (Kodsan or approved equivalent) 10 bar pressure tolerant, - 2,000 Litres capacity with in-built or attached thermostatic Valve, analogue temperature guage on the front face. Only EU compliant models will accepted. Should have 1 PT valve, 2 non-return valve, 4 ball corks accordingly.	3	No.		
5.16	Thermal Fluid Re-Circulation Pump				
5.16.1	Supply, install, test and commission Viscous pump (as Grundfos/ Wilo/ catalyst or approved equivalent)for circulation of the thermal fluid (glycol tolerant) in the closed loop of the indirect system, installed as a dual heat bladed unit 2 in 1 (Duty/ standby), complete with a control system to be triggered by heat sensors complete with pressure gages and aluminum heat tolerance blades for full circuitry and isolators 1.1KW minimum, 1 phase with protection from over voltage.	2	No.		
5.17	Collectors Inter-connection Tubes				
5.17.1	Dia 22 3/4 EZ-Flex Insulated Solar Hoses made of flexible stainless steel or INOX single role Pipes with silicon base sensor wire, armoured braided insulation for closed loop tolerant to 10bars, 300°C.	300	No.		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.18	Re-circulation Controller				
5.18.1	Solar controller with 7 sensor capacity for accuracy between wide area of panels. Heavy duty 3 phase water proof solar controllers that will control the pumps to circulate thermal fluid at appropriate times together with functions to control bacteria build up and over-heating + contactor box.	6	No.		
5.19	Pressure Relieve Valve				
5.19.1	All brass air release valves, pressure release valves, 1 expansion tanks for closed loop, fully integrated digital monitors for monitoring, T joints, high press insulation for visible pipes, sensor brass collates and binary check valves	4	No.		
5.2	Solenoid Valves				
	Solenoid 3 way valve 2 switch Model such as caleffi/ honeywell max 270W or any european brand with certification which will be controlled by controller to regulate flow rate and close when tank temperatures reach 60c in tanks.	12	No.		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
	Boiler Hot Water System				
5.3	Supply, Install, Test and Commission the Portable Hot Water Distribution System with PP- R Piping 80 , Type 3, PN 20 minimum pressure rating to conform to the requirements of BS Standards and to the particular requirements of the site. Allow for all pipe fittings of same manufacture as required to complete the distribution system and all necessary fittings, including but not limited to tapped ends, flexible connectors and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.3.1	50Ø mm PP pipe inclusive of all connections, adaptors and supports, installed in walls, floors, ceilings and ducts	m	20		
5.3.2	Ditto but 63Ø	m	50		
5.3.3	Ditto but 75Ø	m	100		
5.3.4	Ditto but 90Ø	m	40		
5.3.5	Ditto but 110Ø	m	160		
	5.4 Hot Water Pipework Insulation				
	Supply and Install Flexible Elastomeric Insulation according to specifications for hot water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.4.1	50Ø (Diameter)	m	20		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.4.2	Ditto 63Ø	m	46		
5.4.3	Ditto 75Ø	m	80		
5.4.4	Ditto 90Ø	m	40		
5.4.5	Ditto 110Ø	m	132		
5.5	Ball Valves				
	Supply, Install, Test and Commission Ball Valves according to specifications for water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.5.1	DN40 (PP50Ø)	No.	3		
5.5.2	DN50 (PP63Ø)	No.	10		
5.5.3	DN65 (PP75Ø)	No.	34		
5.6	Butterfly Valves				
	Supply, Install, Test and Commission Butterfly Valves according to specifications for water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.6.1	DN80 (PP90Ø)	No.	1		
5.6.2	DN100 (PP110Ø) diameter	No.	38		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.7	Pressure Reducing Valves				
	Supply, Install, Test and Commission Pressure Reducing Valves according to specifications for water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.7.1	DN40 (PP50Ø) diameter	No.	2		
5.7.2	DN100 (PP110Ø) diameter	No.	3		
5.8	Non Return Valves				
	Supply, Install, Test and Commission Non Return Valves according to specifications for water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.8.1	DN65 (PP75Ø) diameter	No.	4		
5.8.2	DN100 (PP110Ø) diameter	No.	8		
5.9	Motorized Regulating/Mixing Valve				
	Supply, Install, Test and Commission Quick Response Three-way Motorized Regulating(Mixing) Valve according to specifications for water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the wo				
5.9.1	DN65 (PP75Ø) diameter	No.	1		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.14	Strainers Supply, Install, Test and Commission Strainers according to specifications for water piping, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
5.14.1	DN65 (PP75Ø) diameter	No.	5		
5.14.2	DN100 (PP110Ø) diameter	No.	2		
5.15b	Supply, install, test and commission Portable Hot Water Heater 2,000LT-8bar with 100kW stainless steel U-shaped hot water heat exchanger (water boiler heated) and 20kW electric resistance, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	4		
5.16	Supply, install, test and commission Primary Heat Exchanger Constant Volume Pump , 14m ³ /h-15mW.G., with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	2		
5.17	Supply, install, test and commission Portable Hot Water Constant Volume Re-circulation Pump 5m ³ /h-10mW.G., with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	2		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.19	Supply, install, test and commission Hot Water Boiler (85°C/70°C) 350kW capacity, with diesel fired burner, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	2		
5.20	Supply, install, test and commission Hot Water Boiler Chimney , inox, double wall with insulation, internal diameter 400 mm, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Lm	48		
5.21	Supply, install, test and commission Hot Water (85°C/70°C) Constant Volume Primary Network Pump 36m ³ /h-10mW.G., with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	2		
5.22	Supply, install, test and commission Hot Water (85°C/70°C) Inverter Controlled Secondary Network Water Heater Pump (SHP-1.1 & SHP1.2) , 36m ³ /h-15mW.G., with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	2		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
5.23	Supply, install, test and commission Hot Water Piping System Expansion Tank Type 500LT-8bar, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work		2		
5.24	Supply, install, test and commission 10m3 Fuel Storage Tank fabricated from 6mm thick mild steel plate of sizes as indicated with lifting lugs 500 mm Dia Manhole Fabricated from 6mm thick plate steel for the body & 10mm Thick sheet Flange & Lid. The above ground fuel Tank to be on steel saddle & finished with Aluminum paint externally with all pipeworks for delivery & Vent piping. Allow for full tank fuel (IDO) first fill.	Item	1		
STEAM BOILER WORKS					
5.25	Supply, Install, Test and Commission Steam Boiler 750Kg/h (500kW) capacity, with gas burner, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	No	1		
5.26	Supply and install Steam Boiler Chimney , inox, double wall with insulation, internal diameter 400 mm, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	m	40		
5.27	Supply, Install, Test and Commission Pressurized Feedtank with Deaerator Head 2500LT capacity, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	No	1		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
	Supply, Install, Test and Commission Cold Water Supply Tank 2,500LT capacity, with all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work	Item	1		
5.28	Supply, Install, Test and Commission the installation of Black Steel, SCH 40 pipe work for the Hot Water System with a minimum pressure rating of PN 20 bar, in accordance with specifications and to the particular requirements on the site with all the necessary wall penetrations. Allow for insulation, all necessary fittings, including but not limited to fixings, adaptors, connectors and accessories supports, tapped ends etc. required for the satisfactory execution of the work and efficient operation of the steam system and all other equipment necessary for steam system (steam traps, steam valves, steam distributor, blowdown tank etc.), complete in all respects.				
5.28.1	DN 20 mm diameter	m	168		
5.28.2	Ditto DN 25 mm	m	224		
5.28.3	Ditto DN 32 mm	m	56		
5.28.4	Ditto DN 40 mm	m	77		
5.28.5	Ditto DN 50 mm	m	28		
5.28.6	Ditto DN 65 mm	m	21		
5.28.7	Ditto DN 80 mm	m	14		
Total Carried to Internal Hot Water Supply Collection Page					

ITEM	DESCRIPTION	AMOUNT (KSH)
	<u>Hot Water Supply Collection Page</u>	
1	Total Brought Forward from BQ Pg. 15	
2	Total Brought Forward from BQ Pg. 16	
3	Total Brought Forward from BQ Pg. 17	
4	Total Brought Forward from BQ Pg. 18	
5	Total Brought Forward from BQ Pg. 19	
6	Total Brought Forward from BQ Pg. 20	
7	Total Brought Forward from BQ Pg. 21	
8	Total Brought Forward from BQ Pg. 22	
9	Total Brought Forward from BQ Pg. 23	
10	Total Brought Forward from BQ Pg. 24	
11	Total Brought Forward from BQ Pg. 25	
12	Total Brought Forward from BQ Pg. 26	
13	Total Brought Forward from BQ Pg. 27	
	Total Carried to Main Summary Page	

ITEM	DESCRIPTION				AMOUNT (KSH)
6.0	<p><u>SANITARY FITTINGS</u></p> <p>Supply and fix the following including all materials and jointing to supply, waste and overflow pipes</p>				
6.1	<p>Wash Hand Basin</p>				
6.1.1	<p>Wash Hand Basin 61 × 50cm as Duravit model No. 374620000 or approved equivalent</p>	279	No.		
6.1.2	<p>Single Lever basin Mixer as Hansgrohe model No. 3112100 or equal and approved.</p>	279	No.		
6.1.4	<p>1 1/4" White Plastic bottle Trap as Viega model or equal and approved</p>	279	No.		
6.2	<p>Water Closet (WC)</p>				
6.2.1	<p>Wall hung WC complete with seat and cover as Duravit DURASTYLE 253809 0637900 or equal and approved</p>	273	No.		
6.2.2	<p>Concealed Cistern with actuator plate in chrome finish, including flush pipes and pan connector, water supply connection with angle stop valve, projected cover for service opening and cover for flush pipe, fixed with included fastening materials in "Pre-wall" bricks as Geberit BZZGEKOMØ1 or approved equivalent</p>	273	No.		
6.2.3	<p>Arabic Shower/Shataffa</p>				
6.2.3.1	<p>Chrome plated holder and hose hand shower with 1.25 m pressure jet as Hansgrohe or equal and approved.</p>	273	No.		
Total Carried to Sanitary Fittings Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
6.3	Urinal Components				
6.3.1	Urinal Bowl with back inlet as Duravit Model No.113.075.00.1 or approved equivalent	71	No.		
6.3.2	Flash Valve with automatic actuator (Mains operated) complete with all operation ready connections and mechanisms as Geberit 116.003.00.1 or approved equivalent	71	No.		
6.4	Physically Challenged Toilets				
6.4.1	Physically challenges set as Armitage Shanks Doc M Contour 21+ close coupled right hand corner pack, WC pan, Wash basin, water saving delay fill cistern with spatula lever, grab rails, hinged support rail with toilet roll holder, seat no cover with retaining buffers, copper tails on TMV3 mixer tap or equal & approved	22	No.		
6.5	Shower Components				
6.5.1	4 way Shower Mixer as Hansgrohe model 31480000 or equal and approved	153	No.		
6.5.2	Shower Set as Hansgrohe Rain Dance Select S 240 2 jet head and Showerpipe model 27129000	153	No.		
6.60	Cleaner's Sink				
6.6.1	Cleaner's Sink AsRegency 25" 16-Gauge Stainless Steel One Compartment Floor Mop Sink - 20" x 16" x 6" Bowl or approved equivalent. The sink to be supplied complete with bib tap and Regency 3 1/2" Mop Sink Drain Assembly or approved equivalent	22	No.		
6.6.2	Cleaner's Faucet as Regency Wall Mounted Mop Sink Faucet with 6 1/2" Swing Spout, 8" Centers, and Vacuum Breaker or approved equivalent	22	No.		
Total Carried to Sanitary Fittings Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
6.70	Bathroom Accessories				
6.7.1	Towel Ring as AMB-06 NAPKIN RING AMBER - AGUA or approved equivalent	284	No.		
6.7.2	Stainless Steel Tissue Dispenser as Jumbo 275mm	284	No.		
6.7.3	1000 x 700 mm Mirror framed to Architect's specifications and approval.	284	No.		
6.7.4	Wall mounted Manual Soap dispenser-1 litre as Mediclinics model no. MDM1000B or approved equivalent	284	No.		
6.7.5	Towel Rack as AMB-10 TOWEL RACK AMBER - AGUA	153	No.		
6.7.6	Soap Dish Holder as AMB-03 SOAP DISH GLASS AMBER - AGUA	153	No.		
6.7.7	Hand Dryer as Mediclinics model No M09AC or approved equivalent	284	No.		
6.80	Kitchen Sink				
6.8.1	Double Bowl sink as FRANKE = GMN 621- 122.5 DBSD INSET 120 X 52 STAINLESS STEEL with drain board made in stainless steel as Franke classic or approved equivalent. The sink to be supplied complete with waste drain and trap	30	No.		
6.8.2	Mixer Pillar Sink Cock as WAR-254G-C/P - WARWICK SINK MIXER WITH SWIVEL SPOUT - W/T = VADO	30	No.		
Total Carried to Sanitary Fittings Collection Page					

ITEM	DESCRIPTION	AMOUNT (KSH)
	<p data-bbox="248 309 671 342"><u>Sanitary Fittings Collection Page</u></p> <p data-bbox="181 383 732 416">1 Total Brought Forward from BQ Pg. 22</p> <p data-bbox="181 450 732 483">2 Total Brought Forward from BQ Pg. 23</p> <p data-bbox="248 517 732 551">Total Brought Forward from BQ Pg. 24</p>	
	<p data-bbox="248 1906 727 1939">Total Carried to Main Summary Page</p>	

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
8.0	<u>WATER TRANSFER, BOOSTER PUMPS, IRRIGATION & DRAINAGE PUMPS</u> Supply, install, test and Commission the following pumps complete with all operation accessories and BMS ready.				
8.1	Water Transfer Pump				
8.1.1	Supply, Install, Test & Commission Pressure boosting system according to DIN 1988 and DIN EN 806, to pump drinking water at a flow rate of 30.00 m ³ /h and pressure of 6.7 bar. The pump to be in a set of 3 duty and 1 standby ready for connection vertically mounted stainless steel centrifugal pumps as Wilo SiBoost Smart t 2 Helix V 3604/2 (3~400V/50 Hz), 4 kW or equal and approved equivalent.	1	Set		
8.2	Submersible Drainage Pump				
	Lift Sump Pit Drainage Pumpset				
8.2.1	Supply, Install, Test and Commission lift pit pump; Flow: 6.00 m ³ /h, Head: 10 m. Mains connection 1~ 230 V / 50 Hz Automation: BMS Ready (1 Duty + 1 Standby)	5	Set		
8.2.3	Accessories: Controller as Wilo EC-L-2x12A-MT34-DOL-WM or approved equivalent	5	Set		
8.2.4	Accessories: Float switch with 10 m cable	5	Set		
Total Carried to Pumps Collection Page					

ITEM	DESCRIPTION			AMOUNT (KSH)
8.2.5	<p>Pump Room/Basement Petrol Interceptor pumpset</p> <p>Supply, Install, Test and Commission fully submersible drainage pump for petrol interceptor sump Flow: 15.00 m³/h, Head: 13 m.</p> <p>Mains connection 3~ 400 V / 50 Hz Automation: BMS Ready (1 Duty + 1 Standby) Preferred Model as Wilo Padus UNI M05/T11-540 or equal and approved.</p>	6	Set	
8.2.7	<p>Accessories: Controller as EC-L-2x12A-MT34-DOL-WM</p>	3	Set	
8.2.4	<p>Accessories: Float switch WA65 with 10 m cable</p>	6	Set	
8.1.1	<p>Rooftop Pressurization Pumpset</p> <p>Supply, Install, Test and Commission pressure boosting pump set Flow: 40.00 m³/h, Head: 30.00 m Mains connection 3~ 400 V / 50 Hz. Automation: BMS Ready (1 Duty + 1 Standby) Preferred model as Wilo SiBoost Smart 4 Helix VE 1006 or Equal and approved</p>	1	Set	
9.1.2	<p>Irrigation Pumpset</p> <p>Supply, Install, Test and Commission fully automatic pump set for irrigation purposes Flow: 60.00 m³/h Head 75.0m. Mains connection 3~ 400 V / 50 Hz. Preferred Model as Wilo SiBoost Smart 2 Helix VE 5205- or equal and approved. BMS COMPATIBLE</p>	1	Set	
Total Carried to Pumps Collection Page				

ITEM	DESCRIPTION	AMOUNT (KSH)
	<p><u>Pumps Collection Page</u></p> <p>1 Total Brought Forward from BQ Pg. 28</p> <p>2 Total Brought Forward from BQ Pg. 29</p>	
	Total Carried to Main Summery Page	

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.0	<u>FIREFIGHTING INSTALLATIONS</u>				
9.1	Pump Room Fully automatic fire pumpset including duty & standby electrically driven pumpset, control panel, interconnecting manifold pipework to Automatic Sprinklers, hoses reels and connection to detection/ alarm system, these to be complete with pressure reducing valve, fittings all mounted on a fabricated steel baseplate to valves, pressure vessel and fittings all mounted on a fabricated steel baseplate to BS5306 as follows;				
9.1.1	Main Pumpset (Electric) Supply, Install, Test and Commission a BMS Compatible Electric & Jockey fire pump set to serve hydrants and wet stand pipes in accordance with EN 12845. Flow: 750,00 US g.p.m. at a head of 120 m. Model as Wilo SiFire-Easy-100/315-318-200E(3~400V/50 Hz, 200 kW) or approved BMS Compatible equivalent.	1	Set		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.1.2	<p>Backup Pump (Diesel & Jockey)</p> <p>Supply, Install, Test and Commission a BMS Compatible Diesel Fire pump set to serve hydrants and wet stand pipes in accordance with EN 12845. Flow: 1000.00 US g.p.m. at a head of 120 m. Model as Wilo SiFire-Easy-100/315-318-197DJ (197 kW) or approved BMS Compatible equivalent.</p>	1	Set		
9.1.3	<p>Valves & Accessories</p> <p>Isolation Valves on pump suction</p>				
9.1.3.1	<p>Sluice valves</p> <p>Supply and install 150mm Sluice valves, non rising spindle, with associated bolts, nuts, washer and gaskets, tested to 10 kg/cm² pressure complete as per specifications for jockey pump suction and main pump suction</p>	13	No		
9.1.3.2	<p>Y-strainers</p> <p>Supply and install 150mm Dia Y-strainers, with associated bolts, nuts, washer and gaskets, tested to 10 kg/cm² pressure complete as per specifications for jockey and main pump suction</p>	2	No		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.1.3.3	Non return valves Supply and install 150mm Dia. Non return valves, CI construction, with associated bolts,nuts, washer and gaskets, tested to 10 kg/cm ² pressure complete as per specifications for jockey and main pump discharge.	6	No		
9.1.3.4	Isolation Valves on pump discharge /test drain Supply and Install 150mm Dia. Butterfly valves, Wafer type, PN 16 rating, CI Body, Nitrile rubber sheet, CI disc, carbon steel shaft, hand operated upto 150 NB, gear operated for 200 NB & above, with associated bolts, nuts, washer and gaskets, tested to 10kg/cm ² pressure complete as per specifications for test drain, jockey and main pump discharge	8	No		
9.1.3.5	Pressure Regulating Valve Suply and Install DN150 flanged type PRV rated for pressure of 7 Bars. The valve shall be UL listed/FM approved	3	No		
9.1.3.6	Outside Screw and Yoke Valve Suply and Install DN150 OS&Y Valve. The valve shall be fully encapsulated EPDM ductile iron Wedge to ensure bubble-tight sealing and UL listed/FM approved	10	No		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.1.4	Pump House Electricals & Instrumentation				
9.1.4.1	Cabling				
	Electrical cabling work with XLPE insulated Aluminium conductor armoured cable routed through standard cable trays from the electrical panel to respective pump, cabling for pressure switches etc..	1	Lot		
9.1.4.2	Local Push Button Stations				
	Supply and Install test and commission LPBS in M.S. enclosure with start-stop push buttons and NO, NC elements. Stop button required with mushroom head and stay-put type arrangement. Mounted suitably on a fabricated stand near each motor.	1	Lot		
9.1.4.3	Annunciator Panel				
	SITC of Alarm Annunciator Panel - 24 windows, with push buttons for test, acknowledge, reset and complete with hooter and other accessories.	1	Lot		
9.1.5	Testing & Commissioning				
	Allow for Testing and Commissioning of the whole Pumping System as described in the Technical Specificatios	1	Lot		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.2	Wet Riser & Hose Sytem				
9.2.1	Breaching Inlet/Booster inlets				
	Supply and Install Fire service 6" x 4 way breaching inlet connection complete with Drain Valves complying with BS 336:2010, PN16 Rated and non-return valves. The breaching inlets to be manufactured to comply to BS 5041	2	No.		
9.2.2	Breaching Inlet Cabinet				
	Supply and install breaching inlet cabinet, recessed type to accommodate 6" x 4 way breaching inlet manufactured to comply to BS5041-5	2	No.		
9.2.3	Standpipe Risers & Drain Pipes				
	Pipework complete with necessary fittings, brackets, bends, elbows, hangers, supports, wall chasing, paintings, trenches, excavation, back-filling, sleeves etc. The quoted rate shall includes of Acrylic Fire stop Sealant (as per IS 12458:1988) in the opening for pipes passing through fire compartment walls of RCC floors, masonry walls to provide up to 2 hours fire rating.				
9.2.3.1	150Ø Dis Black Iron Class C SCH 40	500	m		
9.2.3.2	Ditto 100Ø	450	m		
9.2.3.3	Ditto 75Ø	300	m		
9.2.3.4	Ditto 50Ø	300	m		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.2.4	Automatic Air Release Valve Supply and install DN25 Pressure Relief Valve rated for maximum pressures. The valve shall be UL listed/FM approved	13	No.		
9.2.5	Cabinets for Hose Reel, Fire Equipment & Landing Valve Supply and install double recessed vertical type cabinet to accommodate Fire hosereel, landing valve & fire extinguishers manufactured to comply with BSEN 671-1. The cabinet to be made of electro galvanised sheet and LPCB certified	55	No.		
9.2.6	Fire Hose Reel with Semi-rigid Hose Supply and Install automatic, cabinet mounted type hosereel with 30 meters long, 25Øhose manufactured to BS EN 671-1:2001 and nozzle having SHUT, JET and SPRAY settings. The hosereel should be manufactured to BS EN 694-2001 3169/2 1981 and be able to withstand maximum pressure of up to 15 bars and LPCB certified.	52	No.		
8.2.7	Single Jacket Hose Supply and install single 30 meters jacket hose manufactured according to BS 6391. The Hose to be 100% polyester plain-woven high tensile synthetic rubber lining. The hose to include pin lug coupling & Nozzle manufactured to comply to BS 336:2010. Coupling to be LPCB Certified while the hose shall UL listed	52	No		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.2.8	Landing Valve Supply and install DN2½" single outlet male threaded landing valve, oblique type. The body to made of copper alloy to BS EN 12163:1998 and be LPCB Certified, PRV to be included	55	No		
9.2.9	Testing and Commissioning Allow for testing and commissioning of the whole of wet riser and fire hosesystem to the satisfaction of the Engineer.	1	Lot		
9.3.0	Exacavation of Trenches up to 1.5 mts. in depth, for laying pipes upto 150mm dia. Including forming bottom surface to required level, refilling the trenches with selected excavated earth around the pipe.	800	Mtrs		
9.2.9	Wet Fire hydrant Flanged base inlet as EN1092-2, DN100, PN16	4	No.		
9.2.9	HDPE PN 16 Underground Piiping	300	LM		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.3	Portable Fire Extinguishers Supply, fix, test and commission of the following :-				
9.3.1	5.0 Kg CO ₂ gas fire extinguisher to BS 5423 including the appropriate initial charge and mounting brackets. To LPCB Certified	80	No		
9.3.2	6.0 kg Dry Power fire extinguisher to B.S 3465 and 5423, including the appropriate initial charge and mounting brackets. To LPCB Certified	80	No		
9.3.3	6 Litre. Portable water type fire extinguisher to B.S. 5423 including the appropriate initial charge and mounting brackets. To LPCB Certified	40	No		
9.3.4	9 Litre. Portable foam type fire extinguisher to B.S. 5423 including the appropriate initial charge and mounting brackets. To LPCB Certified	8	No		
9.3.5	6 Litre. Portable wet chemical type fire extinguisher to B.S. 5423 including the appropriate initial charge and mounting brackets. To LPCB Certified	8	No		
9.3.6	4.1 KG. Portable Clean Agent (HFC-236fa) type fire extinguisher to B.S. 5423 including the appropriate initial charge and mounting brackets. To LPCB Certified	6	No		
9.3.7	12kg Automatic dry powder fire extinguisher gas cartridge type in metal casing and fixed to ceiling/roof slab unit as Eversafe' or equal and approved with contents gauge sprinkler head and discharge nozzle	10	No		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.4	<u>Sprinkler Installations</u>				
9.4.1	Zone System Control Valve Set				
	Supply and install compbined Sprinkler DN100 Automatic Zone control valves BS BS 5306-2 / EN 12845	22	Sets		
	Ditto DN 80	8	Sets		
9.4.2	Sprinkler Heads				
	Sprinkler heads complete with dropper pipe work, guards and all necessary accessories:				
9.4.2.1	Concealed sprinkler -68°C K.80(metric)				
	Supply, Installation, Testing & Comissioning of Concealed type, Bulb type Sprinkler with Fusible Coverplate of 15NB, 57° / 68° with heat activated, Standard Response, Powder Coated Plate. as viking or equal and approved	1100	No.		
9.4.2.2	Side Wall sprinkler -68°C K.80(metric)				
	Supply, Installation, Testing & Comissioning of Fusible link type Side Wall Sprinkler of 15NB, 68°. Standard Response, with heat activated black powder coated plate.	200	No.		
9.4.2.2	Pendant/ Upright sprinkler K.80(metric)				
	Supply, Installation, Testing & Comissioning of Pendant type Sprinkler of 15NB, Quartzoid Bulb type 68°. Standard Response, with adjustable Escutcheon Plate in SS 304.	600	No.		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.4.3	Sprinkler System Pipe Works				
	Black Iron Class 'C' schedule 40 to ASTM A106 grade B with screwed and socketed joints to BS 21 including all range piping, fittings, sleeves, puddle flanges, hangers, supports, brackets, and supports				
9.4.3.1	25Ø GMS tubing	3000	m		
9.4.3.2	Ditto 32Ø	1600	m		
9.4.3.3	Ditto 40Ø	1200	m		
9.4.3.4	Ditto 50Ø	1000	m		
9.4.3.5	Ditto 65Ø	800	m		
9.4.3.6	Ditto 80Ø	220	m		
9.4.3.7	Ditto 100Ø	450	m		
9.4.3.8	Ditto 150Ø	900	m		
9.4.4	Coupler				
9.4.4.1	GMS 25Ø	250	No.		
9.4.4.2	Ditto 32Ø	100	No.		
9.4.4.3	Ditto 40Ø	180	No.		
9.4.4.4	Ditto 50Ø	80	No.		
9.4.4.5	Ditto 63Ø	70	No.		
9.4.4.6	Ditto 75Ø	80	No.		
9.4.4.7	Ditto 110Ø	60	No.		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.4.5	Elbow 45°/90°				
9.4.5.1	GMS 25Ø	220	No.		
9.4.5.2	Ditto 32Ø	100	No.		
9.4.5.3	Ditto 40Ø	60	No.		
9.4.5.4	Ditto 50Ø	50	No.		
9.4.5.5	Ditto 63Ø	33	No.		
9.4.5.6	Ditto 75Ø	28	No.		
9.4.5.7	Ditto 110Ø	9	No.		
9.4.5.8	Ditto 150Ø	12	No.		
9.4.6	Equal Tee				
9.4.6.1	GMS 25Ø	230	No.		
9.4.6.2	Ditto 32Ø	120	No.		
9.4.6.3	Ditto 40Ø	250	No.		
9.4.6.4	Ditto 50Ø	180	No.		
9.4.6.5	Ditto 63Ø	90	No.		
9.4.6.6	Ditto 75Ø	10	No.		
9.4.6.7	Ditto 110Ø	10	No.		
9.4.6.8	Ditto 150Ø	15	No.		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.4.7	Cross Piece				
9.4.7.1	GMS 25Ø	30	No.		
9.4.7.2	Ditto 32Ø	25	No.		
9.4.7.3	Ditto 40Ø	20	No.		
9.4.7.4	Ditto 50Ø	50	No.		
9.4.7.5	Ditto 63Ø	60	No.		
9.4.8	Reducers				
9.4.9	GMS 32Ø x 25Ø	230	No.		
9.4.10	Ditto 40Ø x 25Ø	50	No.		
9.4.11	Ditto 40Ø x 32Ø	150	No.		
9.4.12	Ditto 50Ø x 25Ø	20	No.		
9.4.8.5	Ditto 50Ø x 32Ø	30	No.		
9.4.8.6	Ditto 50Ø x 40Ø	100	No.		
9.4.8.7	Ditto 63Ø x 40Ø	82	No.		
9.4.8.8	Ditto 63Ø x 50Ø	80	No.		
9.4.8.9	Ditto 75Ø x 40Ø	50	No.		
9.4.8.10	Ditto 75Ø x 50Ø	70	No.		
9.4.8.11	Ditto 110Ø x 40Ø	10	No.		
9.4.8.12	Ditto 110Ø x 50Ø	12	No.		
9.4.8.13	Ditto 110Ø x 63Ø	10	No.		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.4.8.14	Ditto 110Ø x 75Ø	20	No.		
9.4.8.15	Ditto 160Ø x 75Ø	20	No.		
9.4.8.16	Ditto 160Ø x 110Ø	10	No.		
9.4.9	Reducing Tees				
9.4.10	GMS 32Ø x 25Ø x 32Ø	100	No.		
9.4.11	Ditto 40Ø x 25Ø x 40Ø	80	No.		
9.4.12	Ditto 40Ø x 32Ø x 40Ø	98	No.		
9.4.13	Ditto 50Ø x 25Ø x 50Ø	50	No.		
9.4.14	Ditto 50Ø x 32Ø x 50Ø	40	No.		
9.4.15	Ditto 50Ø x 40Ø x 50Ø	60	No.		
9.4.16	Ditto 63Ø x 40Ø x 63Ø	60	No.		
9.4.9.8	Ditto 63Ø x 50Ø x 63Ø	40	No.		
9.4.9.9	Ditto 75Ø x 40Ø x 75Ø	40	No.		
9.4.9.10	Ditto 75Ø x 50Ø x 75Ø	30	No.		
9.4.9.11	Ditto 110Ø x 40Ø x 110Ø	20	No.		
9.4.9.12	Ditto 110Ø x 50Ø x 110Ø	20	No.		
9.4.9.13	Ditto 110Ø x 63Ø x 110Ø	10	No.		
9.4.9.14	Ditto 110Ø x 75Ø x 110Ø	10	No.		
9.4.9.15	Ditto 160Ø x 75Ø x 160Ø	10	No.		
9.4.9.16	Ditto 160Ø x 110Ø x 160Ø	10	No.		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.4.10	Pipe Plug				
9.4.10.1	GMS ½"	6	No.		
9.4.10.2	Ditto 3"	8	No.		
9.4.10.3	Ditto 4"	10	No.		
9.4.10.4	Ditto 6"	10	No.		
9.4.11	Female Adapter				
9.4.11.1	25Ø x ½"	500	No.		
9.4.11.2	32Ø x ½"	150	No.		
9.4.11.3	Female Tee Adapter				
9.4.11.4	25Ø x ½"	200	No.		
9.4.11.5	32Ø x ½"	80	No.		
9.4.12.3	40Ø x ½"	80	No.		
9.4.12.4	50Ø x ½"	40	No.		
9.4.12.5	63Ø x ½"	40	No.		
9.4.13	Female Elbow Adapter				
9.4.13.1	25Ø x ½"	400	No.		
9.4.14	Female Threaded Union				
9.4.14.1	25Ø x ½"	250	No.		
Total Carried to Fire Fighting systems Collection Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.5	Allow for all pipes hangers (UL-listed) Connectors, Clamps etc. and any other item required for satisfactory operation of hydrant and fire sprinkler systems	1	Lot		
9.6	Alarm Check Valves				
9.6.1	150mm Alarm check valves	5	No.		
9.7	FM 200				
9.7.1	FM 200 Server Room				
	Supply and Installation of FM 200 as HFC-227EA FILLED CONTAINER Assy Impulse Valve Type UL/FM APPROVED, extinguishing control panel, pipework and any other item required for satisfactory operation of the fire suppression system	1	Lot.		
9.7.2	FM 200 UPS ROOM				
	Supply and Installation of FM 200 as HFC-227EA FILLED CONTAINER Assy Impulse Valve Type UL/FM APPROVED, extinguishing control panel, pipework and any other item required for satisfactory operation of the fire suppression system	1	Lot.		
9.7.3	FM 200 Data Center				
	Supply and Installation of FM 200 as HFC-227EA FILLED CONTAINER Assy Impulse Valve Type UL/FM APPROVED, extinguishing control panel, pipework and any other item required for satisfactory operation of the fire suppression system	1	Lot.		
Total Carried to Fire Fighting systems Collection Page					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
9.7.3	<p>FM 200 Data Center</p> <p>Supply and Installation of FM 200 as HFC-227EA FILLED CONTAINER Assy Impulse Valve Type UL/FM APPROVED, extinguishing control panel, pipework and any other item required for satisfactory operation of the fire suppression system</p>	1	Lot		
9.8	<p>Painting</p> <p>Priming and finish painting of the installation pipework with a primer coat and 2 No. coats of postal enamel red complete as required.</p>	1	Lot		
9.9	<p>Testing and Commissioning</p> <p>Allow for setting to work, testing and commissioning of the whole of sprinkler system to the satisfaction of the Engineer.</p>	1	Lot		
Total Carried to Fire Fighting systems Collection Page					-

ITEM	DESCRIPTION	AMOUNT (KSH)
	<u>Firefighting Systems Collection Page</u>	
1	Total Brought Forward from BQ Pg. 21	
2	Total Brought Forward from BQ Pg. 22	
3	Total Brought Forward from BQ Pg. 23	
4	Total Brought Forward from BQ Pg. 34	
5	Total Brought Forward from BQ Pg. 35	
6	Total Brought Forward from BQ Pg. 36	
7	Total Brought Forward from BQ Pg. 37	
8	Total Brought Forward from BQ Pg. 38	
9	Total Brought Forward from BQ Pg. 39	
10	Total Brought Forward from BQ Pg. 40	
11	Total Brought Forward from BQ Pg. 41	
12	Total Brought Forward from BQ Pg. 42	
13	Total Brought Forward from BQ Pg. 43	
14	Total Brought Forward from BQ Pg. 44	
	Total Carried to Main Summary Page	

ITEM	DESCRIPTION	AMOUNT (KSH)
MAIN SUMMARY PAGE		
1	Total for Preliminary & Conditions of Contract B/F from BQ Pg. 1	
2	Total for Internal Soil & Waste Drainage B/F from BQ Pg. 8	
3	Total for Roof Drainage System B/F from BQ Pg. 9	
4	Total for Internal Cold Water Supply Systems B/F from BQ Pg. 14	
5	Total for Internal Hot Water Supply Systems B/F from BQ Pg. 21	
6	Total for Sanitary Fittings B/F from BQ Pg.	
8	Total for Water Transfer, Booster & Drainage Pumps B/F from BQ Pg. 21	
9	Total for Firefighting Installations B/F from BQ Pg. 45	
Total Carried to Mechanical Summary Page SM/1		

PROPOSED CENTRE FOR PARLIAMENTARY
STUDIES AND TRAINING

TECHNICAL SPECIFICATIONS
(BOREHOLE)

Table of Contents

1.1	TECHNICAL SPECIFICATIONS	3
1.1.1	GENERAL SPECIFICATION - GENERAL REQUIREMENTS	3
1.1.2	CONFORMITY VISIT FOR DRILLING RIGS AND CONTRACTOR'S EQUIPMENT	15
1.1.3	METHOD FOR BOREHOLES CONSTRUCTION	15
	Depth and boreholes design	15
	Centralisers and end plug	15
	Gravel pack installation	16
	Partial backfilling of wells	16
	Cementation under pressure	16
	Failure of casing strings to enter well	16
	Formation Sampling	17
	Well head logging	18
	Sanitary seal	19
	Construction of concrete slab	20
	Wellhead block and capping	20
	Failure to complete wells	20
	Fishing	21
	Abandonment	21
1.1.4	AQUIFER TESTING AND WATER QUALITY	22
1.1.5	QUALITY OF MATERIALS AND WORKS	25
	Cement	30
	Cement slurry	30
	Cement mortar	30
	Tools and accessories	30
1.1.6	STANDARDS	31

1.1 TECHNICAL SPECIFICATIONS

1.1.1 GENERAL SPECIFICATION - GENERAL REQUIREMENTS

1.1.1.1 Introduction

These specifications cover the construction of the works and shall be read in conjunction with the Contract Documents as listed in the Instructions to Tenderers

All references given are intended solely for the convenience of those using the above documents and shall be in no way exclude the application of the other clauses in the documents which may, in the opinion of the Engineer have any bearing on the point in question.

• Scope of Works

Scope of works shall include but not limited to;

- i. Preparation of hydrogeological surveys report
- ii. Drilling, casing, gravel packing, development and test pumping of borehole.
- iii. Equipping of the borehole with submersible pumps and switch gear.
- iv. All related electrical installation works.
- v. All related civil and plumbing works and connection to the existing reticulation system.

1.1.1.2 Quality and Approvals

In view of the specialized nature of the drilling work, drilling may only take place under the direct supervision of the Engineer who will provide an on-site supervisor at all times. The Engineer will provide instructions regarding borehole depths and depths for screen installation and will supervise the placing of the gravel pack as well as borehole development and aquifer testing and water quality sampling. Change

When the Contractor experiences particular technical problems and he or his operator seeks help or advice from the Employer and/or the Engineer and this is granted, it will only be on the condition that the Employer and/or the Engineer does not accept responsibility, if such advice or help does not lead to a successful solution of the problem, or results in damage to the Contractor.

The Contractor shall provide all ladders, access lighting facilities and assistance and all things necessary required by the Engineer to inspect any part of the Works.

The materials and workmanship shall be the best of their respective kinds and to the approval of the Engineer. The words “to the approval of the Engineer” shall be deemed to be included in the description of all items relating to design, construction, installation and materials and workmanship for the due execution of the Works.

The Contractor shall submit all data, details and samples as necessary and as reasonably requested by the Engineer of all materials that the Contractor proposes to use in the Works. Method statements which adequately demonstrate the Contractor’s proposed method of working, methods of maintaining safety and compliance with the programme shall be submitted for the Engineer’s approval prior to the commencement of work on any area of the Site.

Where the Contractor is responsible for the preparation of construction documents to describe the permanent works, such construction documents shall be approved prior to the procurement of any materials or commencement of any work to which the documents relate. No materials, Plant or equipment shall be procured for the Contract and no work, permanent or temporary, shall commence without first obtaining the Engineer’s approval.

All materials, Plant and equipment supplied shall be designed for operation under the above described conditions.

1.1.1.3 Construction Documents

Drawings and Documents which are to be submitted by the Contractor to describe the Permanent Works shall become Construction Documents upon their approval.

All drawings, technical specifications, bill of quantities, schedules, cost estimates; programme and other information to be submitted by the contractor shall be in English and shall be submitted for approval in triplicate. Following approval, the contractor shall supply a further five copies to the Engineer. Construction Documents shall not be departed from without the approval of the Engineer.

All drawings and documents submitted by the Contractor shall have been checked, signed and be ready for issue and shall bear:

- Title of the drawing or document;
- Scale;
- Date;
- Work item reference number complying with an approved numbering system;
- Name and references of the Contractor;

- Names of the employer and the Engineer;
- Date of approval by the Contractor and the signature of the person responsible for approval

Drawings and documents submitted for approval shall be delivered to the Engineer's office as designated by the Engineer.

Unless otherwise specified, the Contractor shall allow a minimum of 14 days, after the date of receipt by the Engineer for approval of drawings and documents by the Engineer.

1.1.1.4 Operation and Maintenance Manuals

The Contractor shall submit to the Engineer for approval four copies of the Operation and Maintenance (O&M) Manuals.

The Contractor shall supply the final version of the O&M Manuals prior to the issue of the Taking-Over Certificate for either the whole of the Works or the respective Section or part of the Works. Each set shall be bound together in a stout plastic or other approved cover.

O&M Manuals shall be supplied written in English language, all parts and equipment listings shall be in English

1.1.1.5 Level Datum

Before the commencement of constructional work the Contractor shall establish, in a position to the approval of the Engineer, steel datum pegs which shall be securely concreted in. The level of these pegs shall be established and agreed with the Engineer and all levels used in the construction of the Works shall be referred to these established datum points. The correctness of this datum shall be checked at regular intervals during the construction period as agreed with the Engineer.

Where possible construction drawings and all levels used for construction shall be referred to the national height datum as defined by the Survey of Kenya. The Contractor shall be responsible for obtaining the location and values of the permanent bench marks. In cases where such bench marks do not exist, the site datum shall be agreed with the Engineer.

1.1.1.6 Setting Out of the Works

The site layout drawings show indicative site layouts. Prior to commencing construction, the Engineer will agree with the Contractor the basic information supplementary to that shown on the Drawings such as the position of manholes, chambers, centre-lines and base-lines sufficient for the Contractor to locate the Works.

The Contractor shall prepare detailed setting out drawings and data sheets as necessary and submit them to the Engineer in triplicate for approval. Any modifications to the setting out drawings or data sheets required by the Engineer shall be made by the Contractor and resubmitted for final approval. Should it be necessary during setting out or during construction for the approved setting out details to be amended, the Contractor shall amend the drawings or data sheets or make new ones for approval as required by the Engineer.

For pipelines, the Contractor shall in the presence of the Engineer set-out the pipeline alignments in accordance with the indicative alignments shown on the drawings taking into account physical features on the ground, any existing services, any requirements of relevant Authorities and any changes deemed necessary by the Engineer, confirming the locations of all valves, air valves, washouts, hydrants and bends.

The Contractor shall prepare and submit to the Engineer, at an approved scale, plans of the pipeline route and profiles of ground levels after any initial clearing of the way-leave or easement showing the proposed pipe invert levels and precise chain ages for all valves and fittings for approval. Following approval the Contractor shall submit to the Engineer two copies of the agreed alignment and profiles.

1.1.1.7 Boundaries of Works

The Employer shall provide the Site upon which the Permanent Works are to be constructed. Where a drain or pipeline is to be within an existing road or track reservation or is otherwise located in land designated Public Domain the Site width will be restricted to the limit of the public land. The existing boundary fences and walls shall not be disturbed without prior approval of the Engineer and, unless road diversions and closure notices are approved and posted, carriageways shall be left available for the safe passage of traffic.

The Employer or the Engineer will obtain the necessary permission for access to the drilling sites, but if any access road or bush clearing to provide access to the drill sites will be the responsibility of the drilling Contractor. The contractor shall make own investigation to satisfy themselves on level of scope related to site access and maintain the access throughout the contract It is a recommended to use locally available unskilled labour for this purpose. The Contractor at his own cost will repair any damage to the surface of any private roads, fences or gates by the contractor's plant and equipment. Drilling mud pits and others must be properly filled and levelled after completion of the drilling activities.

Any other damage to private property will be handled strictly according to the General Conditions of Contract.

The Contractor shall not enter upon or occupy with men, tools, equipment or materials any land other than the site without the written consent of the owner of such land.

On occupation of the Site or other land the Contractor shall provide such fencing, as required.

1.1.1.8 Work through Private Land

In order that the necessary parts of the Site which are on private land may be obtained the Contractor shall supply the Engineer with full information of his programme sufficiently in advance of the dates upon which the Contractor proposes to enter upon each areas of the Site. The Contractor shall where required, in consultation with the Engineer, programme the Works to designate the areas of the Site to which the Contractor is to be given possession and the sequence of taking possession.

The Contractor shall obtain written approval before entering upon any private land or cutting through ditch, bank, hedge, wall, fence or any other form of boundary marking and he shall carry out all reasonable requirements as approved by the Engineer in the matter of reinstatement.

1.1.1.9 Public Utility Mains and Services

Where the Contract indicates the positions of existing services or apparatus the positions shown are believed to be correct but no warranty is given as to the accuracy or completeness of the information.

It shall be the responsibility of the Contractor to obtain all information available from the Public Utility Authorities regarding the position of existing mains and services and he shall copy this information to the Engineer as soon as he obtains it.

The Contractor shall carry out excavation works in a manner which safeguards any existing services, including hand excavation as necessary and shall be responsible for the cost of any repair work necessitated by damage caused by him to any main or service and for any costs arising from the disruption.

The Contractor shall obtain all information and assistance from the Public Utility Authorities for the locating of the mains and services and shall agree with the Engineer any trial excavation which may be necessary to confirm or establish these locations.

The Contractor shall be responsible for locating all existing services, whether known to the Public Utility Authorities or not, and shall conduct his own survey as necessary to accurately locate all services. All efforts to identify these existing

services shall be carried out in advance of conducting excavation for the permanent works.

Any temporary or permanent diversion of mains and services shall be agreed with the appropriate Authority.

1.1.1.10 Safeguards to Existing Pipes, Cables, Structures

It shall be the Contractor's responsibility to safeguard by means of temporary or permanent supports or otherwise all existing sewers, pipes, cables, structures or other things which would be liable to suffer damage if such precautionary measures were not taken.

Safeguards shall be to the approval of the Engineer and of the undertaker or owner concerned.

1.1.1.11 Records and Drawings

Daily drilling records must be kept in duplicate by the contractor for each borehole in progress on the form provided. In addition the contractor shall provide separate records for each borehole upon completion (borehole completion form). The relevant information needed to be contained in these records.

The daily drilling record must be signed by both the drill operator for the contractor, and the Engineer's representative on site at the end of each daily shift. It shall be prepared in duplicate in English language. The Engineer will retain the original. The contractor for invoice completion shall use the completed daily drilling records.

The work sheets will contain the following information:

- a) Drilling Rig
 - i. The location of drilling site.
 - ii. Make, model, type & size of drilling rig.
 - iii. Statement of each operation conducted and time taken, including breakdowns, including type of work performed and number of hours on each type of work.
 - iv. Names of all crewmembers.
 - v. Size of hole and meters drilled per shift.
 - vi. Log of soils penetrated.
 - vii. Length and size of casing installed
 - viii. Length and size of screen installed.
 - ix. Length and size of observation pipe installed
 - x. Length and volume of gravel pack, seal or back fill emplaced
 - xi. Any problems encountered.

- xii. The result of bail tests, mud monitoring or other tests carried out.
- xiii. Total standby time to the nearest minute.
- xiv. Well logging
- xv. Development method and time to the nearest minute

b) Test pump Unit

- i. Location.
- ii. Make, model & capacity of test pump.
- iii. Statement of each operation conducted and time taken, including breakdowns, including type of work performed and number of hours on each type of work.
- iv. Names of all crewmembers.
- v. Test pump setting.
- vi. Size of test pump column.
- vii. Total test-pumping time in minutes (total time must agree with pumping test data sheet).
- viii. Total standby time to the nearest ¼ hour.

For sites where the Contractor undertakes permanent works Record Drawings shall be submitted to the Engineer, for approval, in the form of As Built Drawings. Record Drawings shall be prepared to an approved format, and scale in line with the construction drawing.

1.1.1.12 Connections to Existing Pipes, Cables and Equipment

The Contractor shall be responsible for joining up and making connections between pipes and cables laid by him and existing pipes and cables. The Contractor shall submit to the Engineer a drawing showing the details of the connection, and shall state the date on which the particular connection is required, and the work shall not proceed until the Engineer's approval has been given.

The Contractor shall be responsible for ensuring the compatibility of new pipes and cables with existing pipework, cables, tubing and equipment.

1.1.1.13 Lighting, Watching and Traffic Control

Where necessary for safety of the public or where required by the Engineer, the Works shall be properly fenced and signed. In addition, the Works shall be lighted from half an hour before sunset until half-an-hour after sunrise and at other times when visibility is poor. The position and number of the lamps shall be such that the extent and position of the Works are clearly defined. Each Site shall be provided with watchmen as required.

1.1.1.14 Contractor's Offices

The Contractor shall provide and maintain offices for the use of his representative and staff to which written instructions by the Engineer can be delivered. Any instructions delivered to such offices shall be deemed to have been delivered to the Contractor.

Offices shall be located to give convenient access to the Works and shall be subject to the approval of the Engineer. The Contractor shall be responsible for obtaining the land on which to establish any temporary site offices.

The contractor shall be responsible for making all arrangements for the proper disposal of waste.

1.1.1.15 Water and Electricity Supplies

The Contractor shall make all arrangements for and provide adequate supply of potable water to each site as necessary for the execution and testing of the Works and for use by his workmen.

The Contractor shall make arrangements for and provide any electricity supply required for the execution of the Works, including the Tests on Completion.

1.1.1.16 Contractor's Staff and Workmen

The Contractor shall agree to employ Kenyan workers to the maximum extent possible. The Contractor shall provide a competent Site Agent to the approval of the Engineer to be in charge of the work who shall not be changed except with the consent of the Engineer.

The Contractor agrees that his workmen and employees shall be considered for all purposes in his direct pay and employ and under his supervision and control. He shall be directly and personally responsible for discharging all obligations, financial or other, which may be or becoming owing to any such workman or employee or to his successors, assignees or personal representatives. There shall be no contractual or legal relations of any kind whatsoever between the Employer and any such workman, employee or any person employed in the performance of the Contractor's obligations under this Contract.

The Engineer may request and the Contractor agrees to accept the request for the immediate removal from the site of any employee or worker of the Contractor adjudged by the Engineer to be incompetent, disorderly, and unreliable or of bad character. Such employee shall not again be employed on the Works.

1.1.1.17 Project Management

- **Project Control**

The Contractor shall provide within his site organization a project management capability to advise and be directly responsible to the Site Agent. (Contractor's chief site representative) The duties of the section shall include the following:

- a) Planning and programme preparation particularly in relation to the requirements of the Employer and the public authorities, and the requirements to maintain water supply and waste water disposal services where careful detailed arrangements have to be made and adhered to.
- b) Planning the execution of the Works in a manner which minimizes disruption to the water supply system and will permit the efficient and effective commissioning of the water supply system and their respective components.
- c) Ensuring adequate potable water supplies and wastewater disposal services are maintained to all consumers.
- d) Continuous surveillance of progress and anticipation of factors likely to affect the timely performance of the Contract.
- e) Making proposal for modification to forward planning and to the programme at an early stage in the light of factors resulting from (d) above.
- f) Continuous appraisal of the Contractor's methods and routines particularly as to their effect on the community and property.
- g) Forward planning for resource requirements taking due account of possible shortages and delays in the arrival on site of materials, equipment, plant and personnel and their mobilization for effective usage.
- h) Acquisition and process of up-to-date information for progress meetings with the Engineer. The preparation of monthly progress reports including an update of the detailed programme and cash flow forecast which shall include progress photographs as directed by the Engineer.

The Contractor's project management staff shall be of adequate ability and experience. Programmes shall be based upon Critical Path Management (CPM) networks in precedence format and shall be prepared using a suitable PC-based project management software package approved by the Engineer.

Reporting shall be in a manner compatible with the Employers project management procedures and shall use the Earned Value (EV) Technique and

shall monitor the actual gross value of work completed against the predicted value.

- **Monthly Statements and Certificates**

Monthly statements and certificates shall be submitted in an approved manner and format. In addition to the statements submitted in hard copy the Contractor shall submit a computer copy using data base software as prescribed by the Engineer. The statements and certificates shall detail the measured value of the work completed on each item of the Works in such detail that the Engineer can identify location and measurement of each item. A location shall constitute a single structure such as a reservoir, pump station or section of a pipeline or a component of a system such as a pipeline valve complex.

Each item shall be uniquely identified in accordance with the numbering system as instructed by the Engineer.

- **Progress Meetings**

The Contractor shall provide a suitable venue, near the vicinity of the Site, and arrange progress review meetings to be chaired by the Engineer at monthly intervals to coincide with submission of monthly progress submissions. The Contractor shall allow for attendance by the Engineer and up to 4 representatives of the Engineer's or Employer. The meetings shall be attended by the Contractor's senior representatives, Site Agent and other members of his senior staff as may be deemed necessary.

1.1.1.18 Equipment for the Employer

The Contractor shall hand over to the Employer on completion of the Works a complete set of tools and equipment together with spare parts and fittings to facilitate the maintenance and operation of the installed works.

Facilities for Survey and Inspection by the Engineer

The Contractor shall make available technicians and such labour, materials and safety equipment as the Engineer may require for inspections and survey work in connection with the Works. The Contractor shall provide all necessary tackle, test equipment, access, labour, staff and any other thing the Engineer may reasonably require in order that he may safely, conveniently and quickly carry out such inspections as he deems necessary at any time during the execution of the Works and during the Defects Liability Period. The Engineer, his representative and assistants, shall not inspect any area of the Works where they deem the safety provision to be inadequate and the Contractor shall undertake any work required by the Engineer in order to make it safe.

1.1.1.19 Inspections by the Engineer during Defects Liability Period

The Engineer will give the Contractor due notice of his intention to carry out any inspections during the Defects Liability Period and the Contractor shall thereupon arrange for a responsible representative to be present at the times and dates named by the Engineer. This representative shall render all necessary assistance and shall record all matters and things to which his attention is directed by the Engineer.

1.1.1.20 Protective Clothing and Safety Equipment

The Contractor shall provide for the Engineer, his Representative and assistants any additional protective clothing and safety equipment necessary for the proper discharge of their duties on the Site.

The Contractor shall provide any necessary protective clothing and safety equipment for the use of authorized visitors to the site including the Employer and his staff and representatives and those of any relevant authority who have reason to visit the Site.

1.1.1.21 Language of Correspondence and Records

All communications from the Contractor to the Engineer shall be in the English language. All books, timesheets, records, notes, drawings, documents, specifications and manufacturers' literature shall be in the English language. If any of the aforementioned is in another language a certified translation in English shall be submitted to the Engineer.

1.1.1.22 Standards and Regulations

Each and every part of the Works shall be designed, constructed, manufactured, tested and installed in accordance with an internationally recognized standard, Code of Practice, or Regulation applicable to that part of the Works.

Such standards and codes shall include:

- i. British Standard Specification last published.
- ii. International Electromechanical Commission, where available (IEC).
- iii. International Organization for Standardization (ISO).

The Contractor shall provide and keep permanently on site copies of such standards as may be directed by the Engineer and shall make them available to the Engineer as required.

1.1.1.23 Equivalency of Standards and Codes

Wherever reference is made in the Contract, including Specifications, Drawings and Bill of Quantities, to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise stated in the Contract. Where such standards and codes are national, or relate to a particular country or region, other authoritative standards that ensure a substantially equal or higher quality than the standards and codes specified will be accepted subject to the Engineer's prior review and written consent. In the event the Engineer determines that such proposed deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the standards specified in the Contract.

1.1.1.24 Quality Control

The Contractor shall be responsible for his own quality control and shall provide sufficient competent personnel for supervising the Works, taking and preparing samples and for carrying out all necessary tests.

1.1.1.25 Units

The International System of (metric) Units as set out in ASTM E380 shall be used throughout the Contract except where otherwise provided.

1.1.1.26 Inspection and Testing during Manufacture

The performance of each item of Plant or Pipe shall be tested in accordance with the specification to the requirements of the Engineer.

Test certificates in triplicate shall be submitted by the Contractor to the Engineer within 2 weeks of the date of the tests. Type tests are not acceptable. Test certificates shall be supplied for tests carried out on the actual Plant being supplied.

Plant shall not be dispatched from the manufacturer's works until it has passed the specified tests and approval been given by the Engineer.

The Engineer shall at his discretion witness tests of individual items of Plant at the manufacturer's works. The Engineer shall be given three weeks' notice in writing before such tests are to take place.

The acceptance by the Engineer of any item of Plant or equipment after testing at the manufacturer's works shall in no way relieve the Contractor of his responsibility for the correct performance.

1.1.2 CONFORMITY VISIT FOR DRILLING RIGS AND CONTRACTOR'S EQUIPMENT

Before erection of the drilling rig at the first borehole location, the Engineer will verify that the Contractor's has mobilized the equipment listed in the Contract. No authorization to start the drilling works will be given if equipment is not mobilized as listed.

At any moment during drilling operations, the Engineer may interruption works operations if the equipment mobilized by the Contractor differs from those listed in the Contract.

1.1.3 METHOD FOR BOREHOLES CONSTRUCTION

1.1.3.1 Location of boreholes

The final locations of boreholes will be given by the Engineer, with a minimum 5 days' notice before erection of rig at site.

1.1.3.2 Drilling techniques

- **Depth and boreholes design**

The boreholes to be drilled will be required to penetrate thickness up to 10 m to 20 m soil or poorly consolidated sediments. The contractor should indicate clearly in his proposal the drilling technique he will operate for drilling the first poorly consolidated levels.

The required drilling technique down to a depth of about 230m is rotary drilling with bentonite accepted in the drilling fluid (see for characteristics of the drilling fluid)

- **Centralisers and end plug**

In order to achieve the required borehole linearity, all casing permanently installed in wells should be fitted with centralisers at 6 meter intervals or as otherwise directed by the Engineer. The centralisers should be factory manufactured from spring steel straps welded to hinged steel collars to the approval and direction of the Engineer.

A factory manufactured stainless steel end plug will be installed at the bottom of the screen and tubes.

- **Gravel pack installation**

A special attention will be paid to quality of gravel pack installation. The mud circulation should be maintained during gravel pack installation.

No gravel pack could be installed in the well without use of a cross-over tool. With this tool, the fluid and filter pack pumped down through the drill pipe will discharge below the packer associated to the cross-over tool while the return flow will be conducted up through the packer into the annular space around the drill pipe. The stinger pipe below cross-over tool will extend to some 1 m of the bottom of the screen.

In order to prevent undesirable separation of coarse and fine fraction of the gravel pack, the uniformity coefficient of the mixture will be lower than 2.5 (see § 5.6. Characteristics of the gravel pack). In order to check the perfect installation of the gravel pack, a 3m piece of tell-tale screen will be installed above the production screen, inside the telescoped section

- **Partial backfilling of wells**

The Contractor may be required to backfill an existing well to a depth specified by the Engineer. The backfill material will consist of sand and ten millimetres by twenty millimetres crushed or graded gravel or other sized gravel. All such backfill material must be approved by the Engineer before being used in the well.

- **Cementation under pressure**

The Cementation under pressure should be done from the bottom through a cementing shoe: the annular space shall be filled in by cement up to cement appears at the surface. If cement fail to reach the surface, the Contractor, should at his own cost and to the satisfaction of the Engineer, demonstrate that the cement is continuously sealing the casing from the bottom to half of the cemented depth. It should then continue the cementation from the surface and finally demonstrate at his own cost and to the satisfaction of the Engineer, that cement is continuously sealing the whole casing.

Should the Contractor fail to conduct these operations to the satisfaction of the Engineer, the borehole may be declared lost.

- **Failure of casing strings to enter well**

In the event that any string of casing will not enter the well, the casing will be removed and the well will be reamed or re-drilled. If the string of casing still does not enter the well, the well will be declared lost.

1.1.3.3 Drilling Sequence

- Drilling of the poorly unconsolidated levels, up to 10 to 20 m
- Installing of a surface casing from the bottom of the hole to the surface
- The surface casing will be fixed in position by cement being placed in the bottom half meter of the hole by tremmie pipe installed inside the casing, to ensure that the surface pipe remains plumb, and that there is an annular seal for the cement. The annular space between the well and the surface casing will then be filled with cement up to 1 m below ground surface. Once in place the cement will be allowed to set for a period of 12 hours
- Drilling the borehole down to a depth of about 230 m (diam. 20 or 22") below the ground.
- An electrical well logging shall be performed and decision can be taken to continue drilling (come back to previous indented line)
- The extrados of the casing is cemented under pressure from the bottom up to the surface. The Contractor will provide all necessary equipment to ensure the correct and successful displacement of the cement. Before proceeding with the cementing of the casing, circulation should be established around the casing without any loss and on completion of the cementing some cement should return to the surface.
- The cement is allowed to set for 24 hours minimum
- Gravel pack shall be installed beneath the screens and tubes using a cross-over tool.
- The borehole is then developed
- A full pumping test is completed
- The well head is constructed

1.1.3.4 Sampling and logging

- **Formation Sampling**

Representative samples of the strata penetrated will be collected every meter (or as otherwise directed and approved by the Engineer), by whatever method is standard for the drilling technique in use.

A sample of the formation cuttings will be removed from the drilling medium by collecting the sample in a screen, or by collecting a large sample of the drilling fluid and allowing the cuttings to settle out. Care will be taken to ensure that the

sample is representative of the material being drilled and not contaminated by hole erosion or cavings.

The samples will be placed in approved and appropriately marked heavy plastic sample bags and handed over in a sturdy box to the Engineer. The sample box will be a container fitted with individual compartments for the samples. A card will be inserted into each compartment along with the sample, indicating, in water-proof ink, the depth from which the sample was recovered.

When requested by the Engineer, the samples will be displayed in a neat and organized manner so that the entire geologic section is clearly represented.

- **Well head logging**

Penetration rates, measured as minutes per meter drilled, must be recorded for every meter in the drillers log in regard with the pressure on the tool. The Contractor must report immediately to the Engineer's representative on site any changes in the penetration rate. The penetration rate report must include the method of drilling used and if any changes in the drilling method must be recorded its depth and time of change. Drilling interruption for flushing without drilling, stoppage during installation of additional drill pipes; breakdowns, etc. must be properly recorded so that the drilling rates can be properly interpreted purely based on time taken for drilling.

The contractor shall endeavour to operation in such a way as to detect water strikes by noting increases in flow rates. For this purpose marsh funnel and stopwatch must be available. In order to measure yield rates during drilling and so to obtain an indication of water strikes, the return water must be directed through a gauging weir consisting of a 90o weir plate (V - Notch) installed at a suitable point in the return water circulation system. The dimension of the V-Notch should be at least 800mm wide across the top and the V and 400 mm vertical depth.

1.1.3.5 Borehole development and clean-up

Well development will be conducted with successively both airlift pump system and interrupted over-pumping. All well development methods and chemicals must be approved by the Engineer.

For airlift pump system, it is a requirement that the double-tube airlift method to be used by the drilling contractor for the development of boreholes. Development must begin from the bottom of the borehole, the apparatus being placed about 1 m above the base of the borehole. The air is turned on and off repeatedly to agitate the fine material within the gravel pack and the surrounding formation. This process continued every two meters upward within the borehole until the static water level is reached. Once this is completed the apparatus is lowered to the bottom of the borehole to remove sand and gravel

and the borehole is then further airlifted until the water is totally clean to the satisfaction of the Engineer.

For interrupted pumping, the pumping shall be done at rates up to 2 times the design capacity. The pumping should be carried out in at least 5 steps, which should include pumping rates of 0.25, 0.5, 1, 1.5 and 2 times the design capacity, with no check valve nor foot valve present. Pumping shall be conducted in 5 minute cycles.

Development shall continue for a minimum of 6 hours air-lift development plus 3 hours interrupted pumping development and until the discharge water is clean and free of sand (i.e. no more than 1 cm diam. sand stain test) or until such time as the Engineer finds acceptable. No payment shall be made for the extra hours necessary after 15 hours of development

1.1.3.6 Borehole Disinfection

The Contractor shall at all times take every precaution to ensure that the borehole is kept free of contamination. The Contractor will ensure that formation stabilizer material is disinfected prior to installation.

Disinfection of the borehole shall be undertaken immediately after the borehole development process has been completed. The Contractor will devise a method for the disinfection procedure that meets the approval of the Engineer. The Contractor will include the cost of the disinfection process in his unit process for borehole construction.

The Contractor shall ensure that the disinfecting agent is uniformly applied throughout the entire water depth of the borehole. The disinfecting agent may be placed by a tremie pipe of sufficient length to extend to the bottom of the borehole. The disinfecting agent shall be applied through the hose that shall be raised and lowered to achieve uniform distribution of the solution throughout the borehole.

1.1.3.7 Concrete slab, well heads and capping of boreholes

- **Sanitary seal**

The annular space between the borehole and wall of the surface casing shall be grouted for sanitary seal for a depth not less than 2 m below ground surface with mixture of cement and water slurry by a pour-in method from the top.

Cement grouting shall be carried out in one continuous operation before initial setting of the cement occurs. Regardless of the method used, the grout shall be introduced at the bottom of the space to be grouted. In no circumstance will this

be less than 2 m below the wellhead. The method proposed by the Contractor will be changed or modified if and required to suit the local conditions

- **Construction of concrete slab**

After the completion of the borehole to the satisfaction of the Project Manager, the Contractor if must excavate around the sanitary seal until reasonably firm formation is reached.

The ends of the surface casing shall be cut off 0.5 m below the surface level. The Contractor shall construct a reinforced concrete block (with 12 mm steel reinforcing rods at equal spacing) with the surface dimension of 1 m width, 1 m length and 1.5 m high (1 m below the surface level, 0.5 m above the surface level). Surface of the concrete block will have a divergent slope.

The well casing must protrude 0.2 m above the concrete block unless otherwise specified by the Engineer.

The wellhead block shall be cast around the surface casing in accordance with the Contract drawings, with 0.5 m inside the concrete slab.

- **Wellhead block and capping**

The wellhead block without artesian pressure is detailed in the drawings section. The Contractor shall supply all materials and carry out the construction of the wellhead according to the following instructions:

- ❖ on the top of this casing, a welded flange (stainless steel, 10 mm tick);
- ❖ Over the flange, a capping plate (stainless steel, 10 mm tick) bolted together with the coupling in 8 points and welded in 10 points.

The wellhead block with artesian pressure will be equivalent to the above, but should stand up to 3 bars pressure.

The well head shall be marked with the well number, in a manner approved by the Engineer.

1.1.3.8 Lost boreholes and abandonment

- **Failure to complete wells**

Should any accident to the plant, jamming of the tools or casing, collapse of the borehole, or any other causes due to the Contractor's negligence, prevent the satisfactory completion of the works, the borehole shall be deemed to be lost and no payment shall be made for that borehole or for any material not recovered there from, nor for any time spent during operations or while attempting to overcome the problems. The option of declaring such lost well shall rest with the Contractor.

In the event of a well potentially being deemed lost, the Engineer may where possible redesign the well so that it is of use to the Employer and payment will be made in accordance with quantities and rates written in the Contract document. Should it not be possible to do this, the well shall be declared 'lost'.

A well may also be declared lost by the Engineer if it is not completed as required due to uncontrolled caving, lost tools down-hole which cannot be recovered, lost circulation zones, unsuccessful cementing or any other reason which leads to failure of completion and which renders the well useless or of little value to the Employer.

A lost hole should be neutralised by a full cementation at the satisfaction of the Engineer.

No payment shall be made for a lost well and its neutralisation.

In the event of lost well the Contractor shall drill a new well at a site indicated by the Project Manager.

- **Fishing**

Under no circumstances will the Employer pay any charge for time spent on fishing operations due to the Contractor's negligence, broken drill string components, stuck pipe, junk in the hole or any other reason. Contractors are advised to assure themselves of the good condition of all drill string components and maintain adequate wellhead security at all times.

- **Abandonment**

The Engineer shall have the right at any time during the progress of the work to order the abandonment of a borehole.

The Contractor thereupon shall withdraw the casing from the borehole, if applicable, and salvage or attempt to salvage all such materials as the Engineer shall direct and/or up until the Engineer revokes such direction and shall fill in or leave the borehole to the satisfaction of the Engineer. Aquifers may be sealed by cement.

Payment shall be made for such abandoned boreholes at the rates and tariffs shown in the Bill of Quantities.

1.1.4 AQUIFER TESTING AND WATER QUALITY

1.1.4.1 Introduction

The aquifer pumping test is a thorough and precise test of the characteristics of the water bearing formation in the vicinity of the well. It is of prime importance that the Contractor correctly monitors test pumping operations to ensure that accurate data is obtained. Testing work will be carried out with the intent of maximising the chances of success in completing tests within the allocated period of time.

For testing operations, the pump test will be installed at the bottom of the pump house, i.e. the bottom of the casing.

1.1.4.2 Calibration test

Before beginning the actual tests on each well, a calibration test must be undertaken. This involves checking that all equipment including the pump, generator, manometer and pipes are working satisfactorily. The discharge pipeline shall be checked for leaks. The gate valve shall be graduated and relative discharge positions marked in preparation for the step test. Once the calibration test has been completed the well must be allowed to recover to the satisfaction of the Engineer, before the actual test pumping operations can begin.

The cost of the calibration test shall be uniformly spread over the pump test items of the Bill of Quantities.

1.1.4.3 Tests sequence and duration

If calibration test shows that a well has sufficient capacity to be interest, pump testing shall be carried out. The following two types of test may be conducted according to the instruction of the Engineer.

- Continuous Step Draw-Down test: The Step Draw-Down test shall have six (6) steps of one (1) hour each, without rest period. The test shall begin with the lowest discharge rate (about 1/5 of the pump capacity) and increase consecutively until the maximum discharge rate is reached. (About 150% of the planned well yield). Upon completion of the step drawdown test, a step recovery test shall be undertaken, which should normally last for at least two (2) hours or as otherwise directed by the Engineer.

- Constant discharge test. Constant discharge tests will be hundred twenty (120) hours in length followed by a twenty four (24) hours recovery period, at a pumping rate close to the planned well yield (70 l/s or 115 l/s). The Engineer or his representative during the test on the basis of the measurements made and his analysis may increase or reduce both periods thereof.

The pump test shall be terminated only upon the written notice of the Engineer or his representative.

The test pump cannot be removed from the well during the recovery periods.

The pumped water during pumping test should not be allowed to from pools to avoid re- infiltration in the vicinity of the wells. If the Engineer feels that infiltration would take place around the well he can order the Contractor to dispose the water by means of discharge pipes toward a nearby natural drain over a distance where infiltration in to the aquifer during testing is negligible.

1.1.4.4 Water level measurements

During the period of the tests, the Contractor shall measure and record water levels in the pumped well. For measurement of water levels in wells, pressure meter or electric water level indicators shall be used.

If water level indicator is used, the Contractor shall have at least two water level indicators on each site. In the tested well, the measurement will be done through a temporary measurement pipe which shall be deep enough to reach the top of the pump.

The water level measurement will also be done in up to 2 neighbour wells designated by the Engineer.

For the tested borehole, the following time intervals are recommended:

Every	1	minutes	0	to	10	minutes of pumping
Every	2	minutes	10	to	30	minutes of pumping
Every	5	minutes	30	to	60	minutes of pumping
Every	10	minutes	60	to	360	minutes of pumping
Every	15	minutes	360	to	600	minutes of pumping
Every	30	minutes	10	to	24	Hours of pumping
Every	60	minutes	24	to	72	hours of pumping

1.1.4.5 Flow measurements

Flow measurements shall be made by means of a gauging weir consisting of a 90o weir plate (V – Notch) as described in the drawing section.

Flow measurements will be made for any water level measurement.

The contractor is responsible with mobilising testing pump with sufficient capacity to meet the planned well yield.

1.1.4.6 Interruption of the test pumping

The discharge rate during the pumping shall be maintained within five per cent of the rate established by the Engineer and the Contractor shall maintain uninterrupted pumping during the period of all tests. If not so, the Engineer may declare the test interrupted. Shall the Contractor fail to provide accurate water level and flow measurement with the recommended frequency, the Engineer may also declare the test interrupted.

No payment will be made for the elapsed time of the test prior to the interruption. Unless otherwise directed by the Engineer, interrupted tests shall not be restarted until sufficient time has elapsed for complete recovery of the water levels in the pump or observation well and shall not be considered to be a part of the pumping test for purposes of payment even though water level measurements shall be made during that period by the Contractor if so directed by the Engineer.

1.1.4.7 Reporting

The contractor shall record test-pumping data on prepared sheets after the approval of the Engineer. The data sheet shall be filled in the English language. The data sheets prepared in triplicate shall include the following information:

- i. The location of the well being tested.
- ii. The physical characteristic of the well including depth, diameter, size length of casing screen setting and length of screen.
- iii. Characteristics of the test pump
- iv. Depth of setting of the test pump in meters.
- v. Date and time of start and finish of pumping test.
- vi. Static water level at commencement of test, dynamic water levels and discharge rates at prescribed time intervals.
- vii. Draw -down recovery after pumping is completed.
- viii. Date and time of start of removal of test pump from the borehole.

1.1.4.8 Water samples and analysis

Water samples for water quality analysis must be collected during the pumping test as directed by the Engineer. Each sample consists of 4 containers as in a glass or suitable plastic container of 1-liter capacity each.

Water samples should be clearly marked showing name of well, date of sampling, hour of sampling, temperature and conductivity of water during sampling and signature of person taking the sample.

2 sets of samples are dedicated for future ICP-MS analyses and will be stored. 1 set will be stored for cross-check analysis if required.

One sample shall be sent to a Laboratory approved by the Engineer within 12 hours after sampling. During transportation, the sample shall be kept in an isotherm box.

The contractor shall carry out water analysis for at least the following:

- Temperature
- Electrical conductivity at 25°C
- pH at 20°C
- Cations: Ca⁺⁺ Mg⁺⁺ Na⁺ K⁺ and total Fe
- Anions: Cl⁻, NO₃⁻, SO₄⁻⁻ and HCO₃⁻

Note:

- i. The Project Manager may order additional analyses if deemed necessary to achieve project objectives
- ii. Contractor is responsible in ensuring that the samples are stored in correct temperature condition throughout the contract, if deemed necessary the contractor shall provide air-conditioned room exclusively for storing the samples.
- iii. Time of storing: till the demobilization.

1.1.5 QUALITY OF MATERIALS AND WORKS

1.1.5.1 Erection of drilling machine at borehole site

The drilling machine must be erected at the borehole site in such a way that the hole will be drilled within 1 m of the marks which is shown to the contractor by the Engineer. No payment will be made for a well not located at the designed site

1.1.5.2 Verticality and alignment of boreholes

The wells will be drilled and cased straight and vertical, and all casing, screen or liners will be set plumb and true to line.

Upon completion of drilling or at any other time, the borehole shall be tested for verticality and straightness using deviation-measuring instruments like Inclinometer, Draft Indicator etc., provided and operated by the Contractor at the Contractor's own expenses. Readings of deviation and direction will be taken at three meters depth intervals. Deviation shall be no more than 10%.

After pump house casing installation, verticality will be tested by the plumb-bob method. The dummy will consist of an axially suspended cylinder (or cage-ring) at least 7 m long with an external diameter as specified in the Conventional Code of Testing Boreholes. The suspending wire should be less than 5 millimetres diameter of uniform cross section with no kinks. Dummy should freely be passed down the borehole without force. Dummy is provided and operated by the Contractor at the Contractor's own expenses.

Should the plumb or dummy fail to move freely throughout the length of the casing or hole to the bottom of the housing line or should the borehole vary from the vertical in excess of above specified value, or beyond limitations of this test, the plumbness and alignment of the borehole shall be corrected by the contractor at his own expense. Should the contractor fail to correct such faulty alignment or verticality, the well may be deemed lost. The Engineer may waive the requirements of this paragraph for verticality if in his judgment he establish that:-

- The Contractor has exercised all possible care in constructing the borehole and the defect is due to circumstances beyond his control.
- The usefulness of the completed borehole will not be materially affected.
- The cost of necessary remedial measures will be excessive.

In no event will the provisions of this paragraph with respect to alignment be waived.

1.1.5.3 Assembling of casing, tubes and screens

The assembling methodology for casing, tubes and screen will be submitted to and approved by the Engineer before operation. A particular attention will be paid to the external diameter of tubes and screens, and his compatibility with cementing or gravel pack installation.

The 18"5/8 casing may be coupled to each other either with welds. In order to secure mechanical and corrosion resistances, the Contractor should submit the certificates and qualifications of the welding operator as well as the welding procedures to the Engineer and get his approval before starting operations. All

welding electrodes must comply with the Standard Specifications DIN 1913 or AWS (American Welding Society) standards.

The 13³/₈ tubes and screens may be coupled to each other either with tight sleeve connection (ZSM connection 2 rods version).

The 8⁵/₈ and 10³/₄ (type 2) tubes and screens may be coupled to each other either with tight sleeve connection (ZSM connection 2 rods version) or with API round threaded connection.

The 10³/₄ (type 1) tubes and screens may be coupled to each other either with API round threaded connection.

In case of threaded connections, the lubricating compound shall not contain any heavy metal or hydrocarbon

1.1.5.4 Characteristics of the drilling fluid and additives

In order to limit the environmental impact and to improve the mud quality, the contractor should use mud tanks. Hand dug pits for mud are forbidden.

Drilling mud should be of biodegradable type and non-toxic and amenable to degradation by an appropriate chemical agent. The use of bentonite mud is only authorized for drilling of the sealed terrain, i.e. less than about 230 m.

The Contractor must ensure that if the Employer or Engineer specifies mud drilling, he has the necessary equipment including mud pumps, viscosity-measuring apparatus, water tanks etc., to enable him successfully complete the works.

The Contractor shall specify the brand name and manufacturer of any mud or chemicals or additives proposed to be used and include technical specifications or any other relevant data. Readings of the mud condition (pH, viscosity, density and sand content) will be collected and recorded as directed by the Engineer. Steps will be taken immediately to correct any variations of the preferred values.

A special and permanent attention should be paid to the density of the drilling mud, in regard to the expected high artesianism of the aquifer. Balanced mud weights will be used for control of the artesian conditions. Barite may be used for mud weight control.

Where applicable and required, mud dispersing agents (such as glassy phosphate), acids for washing limestone, and other chemicals applicable to standard procedures may be used as. If polyphosphates are used, it must be followed by well disinfection. It is recommended, however, to provide a polyphosphate product that already contains disinfecting agents (i.e. Weltone' or equivalent)

1.1.5.5 Characteristics of the casings and screens

Surface casing can be standard black steel casing. All other casing, plain tubes and screens will be made of 304L stainless steel or equivalent.

The 10 3/4" tubes and screens characteristics should be:

- Tubes: Internal and external longitudinally welded pipe AISI 304L according to ASTM A312 or DIN 4922 with ferrite content <5% and OD 273 mm
- Tubes and screens: the minimum collapse resistance will be 65 bars for the type 1 (the standard pipe 273 x 9.27 mm should meet this requirement) and 50 bars for the type 2.
- Before shipment material will be picked and passivated according to ASTM A380

The 8 5/8" tubes and screens characteristics should be:

- Tubes: Internal and external longitudinally welded pipe AISI 304L according to ASTM A312 or DIN 4922 with ferrite content <5% and OD 219 mm
- Tubes and screens: the minimum collapse Strength will be 70 bars (the standard pipe 219 x 8,18 mm (Sch 40) should meet this requirement).
- Tubes and screens: the minimum collapse Strength will be 70 bars (the standard pipe 219 x 8,18 mm (Sch 40) should meet this requirement).

All screens to be installed into the boreholes would be with 0.75 mm slot (tolerance 0.2 mm). This slot might be modified to 1 mm (tolerance 0.2 mm) slot after the first series of tests. The authorized open area will range from 6.5% to 9.5%, in order to maintain an entry velocity from 2 to 3 cm/s. In case of use of pipe base wire wound screens, the pipe has to offer an open area significantly higher than the continuous wire open area, and 13% minimum.

All casing and tubes supplied by the Contractor and which will be installed permanently in the boreholes must be with no circular welding; only longitudinally welding is allowed except to connect the fittings. None of the pipes will made of short pieces welded together.

All casing and tubes supplied by the Contractor and which will be installed permanently in the boreholes must be new and must comply with the ASTM standards. The appropriate manufacturer's product information pamphlets with full details of the offered casing, tubes and screens, including method of joining must be provided to the Engineer and accepted before installation in the hole. The following information should be engraved on equipment:

- Customer project name
- Supplier name
- Material
- OD and slot for screens, OD and nominal thickness for tubes

The Contractor will organize at his own costs a qualitative inspection, carried out by a recognized international certification company (third part inspection – choice of the third party to be given to Engineer). It must be held for the release of the equipment at supplier site to check conformity of:

- Origin of stainless steel, traceability during manufacturing process to avoid mix of different stainless steel.
- Quality plan, quality certificate and qualification of manufacturer, welding operators qualifications, welding procedures

Material manufacturer certificates according to EN 10204 / 3.1

- Dimensional results (slot measurements, tally list)
- X-Ray control of the longitudinal welded joint (for 2% of length over 10% of the pipes number randomly selected)
- Before shipment material will be pickled and passivized according to ASTM A380
- Destructive tensile test (on a partial length of 13"3/8, 10 3/4 and 85/8" screen). The Contractor should demonstrate that these figures are compatible with the weight of columns of screen and tubes.
- Full length destructive collapse test (on pipes and screens 13"3/8 , 10 3/4 and 85/8")
- Internal pickling report and internal acceptance report of the production, as well as environmental report on passivation plan

The Contractor will organise at his own costs (covering travel, accommodation for a minimum of 3 days, subsidence) the participation of two (2) representatives of the Client to the qualitative inspection.

1.1.5.6 Characteristics of the gravel pack

The gravel pack will consist of quartz sand and gravel will not contain any carbonate calcium. The material must be clean well-rounded 90 % composed of quartz. The use angular crushed material is not acceptable. Considering the nature of the aquifer material and the specified screen aperture, the required grain size for 95% of the gravel pack material should be 1.0 mm to 2, 5 mm.

5 kg sample of the gravel pack material must be submitted to the Engineer for approval before use. Such approval shall be issued in writing and under no

circumstances is the contractor to produce gravel for the work until such approval has been received.

1.1.5.7 Characteristics of the cement

- **Cement**

All cement, which is used, must comply with the Standard Specification DIN 1164, EN 197,

DIN 18555 and must not be older than three months. Unless otherwise instructed by the Engineer or the Employer, a hardening agent such as calcium chloride should not be used to accelerate the cement setting process. The normal aggregate size for use with the cement may not exceed 19 mm unless otherwise stated.

- **Cement slurry**

The cement used for cement slurry will be PORTLAND artificial CPA325 type.

The water used shall be potable water. No less than 800 kg of cement will be used per cubic meter of water

- **Cement mortar**

The cement used for cement slurry will be PORTLAND artificial CPA325 type. The water used shall be potable water. No less than 50 kg of cement will be used for 100 l of water. A minimum of 600 kg of cement shall be used per cubic meter of sand.

- **Tools and accessories**

For accessories listed below, the contractor should provide and get approved drawings including all technical details, quality plan, reference and origin:

Production well head with and without artesian pressure.

- ❖ Bottom plug;
- ❖ Centralizers;
- ❖ Handling tools and clamps for pipes and screens (according to EEC safety rules), and;
- ❖ Cross-over tool.
- ❖ Cross-over tool

1.1.6 STANDARDS

1. ISO/IEC 17020:2012 – Conformity Assessment Requirements for the operation of various types of bodies performing inspection.
2. ILAC P15:06/2014 – Application of ISO/IEC 17020:2012 for the Accreditation of Inspection Bodies
3. SAC-SINGLAS 006 - Traceability of Measurement
4. BS 5930:2015 – Code of practice for site investigations
5. BSISO 14686: 2003 – Hydrometric Determination Plumbing tests for Wells. Considerations and guidelines for design, performance and use.
6. BS EN ISO 14688-1:2002+A1:2013 – Geotechnical investigation and testing.
7. BS EN ISO 14689 Part1:2003 – Geotechnical investigation and testing.
8. BS EN ISO 22282-1:2012 – Geotechnical investigation and testing – Geohydraulic testing: Part 1- General rules
9. BS EN ISO 22282-2:2012 – Geotechnical investigation and testing – Geohydraulic testing: Part 2 – Water permeability tests in a borehole using open systems
10. BS EN ISO 22282-3:2012 – Geotechnical investigation and testing – Geohydraulic testing: Part 3 – Water pressure tests in rock
11. BS EN ISO 22282-4:2012 – Geotechnical investigation and testing – Geohydraulic testing: Part 4 – Pumping tests
12. BS EN ISO 22282-6:2012 – Geotechnical investigation and testing – Geohydraulic testing: Part 6 - Water permeability tests in a borehole using closed systems
13. BS EN ISO 22475 Part1:2006 – Geotechnical investigation and testing. Sampling methods and groundwater measurements. Technical principles for execution.
14. BS EN ISO 22476 Part1:2012 – Geotechnical investigation and testing. Field testing. Electrical cone and piezocone penetration test
15. BS EN ISO 22476 Part 3:2005+A1:2011 – Geotechnical investigation and testing – Standard Penetration Test.

16. BS EN ISO 2274 Part 4:2012 - Geotechnical investigation and testing - Menard Pressure meter Test
17. BS EN ISO 22476 :Part 5 :2012 - Geotechnical investigation and testing - Flexible Dilatometer Test
18. BS EN ISO 22476: Part 11:2006 - Geotechnical investigation and testing - Flat Dilatometer Test
19. ASTM D6274 Part 18 - Standard Guide for conducting Borehole Geophysical Logging - Gamma
20. BS 7022:1988 - Guide for geophysical logging of boreholes for hydrogeological purposes.

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.0	PRELIMINARY BOREHOLE SURVEY				
1.1	Reconnaissance surveys. This inclusive comprehensive desk study on the Site	1	Lot.		
1.2	Mobilize to the site of works and carry out comprehensive mapping using resistivity methods. (Hydro geological / Geophysical Borehole site investigation.)	1	Lot.		
1.3	Compile detailed – survey report on the survey finds	1	Item		
1.4	Application and follow – up of the necessary drilling Authorization for the Borehole works	1	Lot.		
2.0	ENVIRONMENTAL ASSESMENT PHASE				
2.1	Conduct a comprehensive NEMA Assessment on the program. This inclusive of report compilation to statutory requirements	1	Lot.		
2.2	Payments of statutory amounts to Governments for the entire project.	1	Lot.		
3.0	BOREHOLE DRILLING				
3.1	Mobilization set up/ camp / restitution /demobilization on completion.	1	Lot.		
3.2	Drilling rig set -up at the site	1	Lot.		
Total Carried to Borehole Drilling Summary Page Page No. 4					-

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
4.0	DRILLING				
4.1	Depth not exceeding 5.0 metres for the conductor pipe – 254mm Diameter	5	M		
4.2	Drilling at 225mm for the depth 5.0m – 100.0m	95	M		
4.3	Drilling at 225mm for the depth 100 – 200.0m	100	M		
4.4	Drilling at 225mm for the depth > 200.0m	100	M		
4.5	Sampling and logging works at 2.0m intervals	125	No.		
4.6	Anticipated Drilling foam usage – for improvement of cuttings recovery	1	Lot.		
4.7	Supply drilling and domestic water for both down hole injection and domestic purposes at the site	1	Lot.		
5.0	CASING & SCREEN				
5.1	153mm diameter Steel casings class B-Plain	220	M		
5.2	153mm diameter Steel screens class B in plasma slots.	80	M		
5.3	154mm slide in borehole cap	1	No.		
5.4	Supply and install quartz pea gravel, 2-4 mm grain size	8	Ton		
5.5	Backfill to 10 metres below ground level with drill cuttings.	10	M		

Total Carried to Borehole Drilling Summary Page Page No. 4

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ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
6.0	BOREHOLE DEVELOPMENT				
6.1	Chemical development through Calgon injection.	50	Kgs		
6.2	Physical development through air-jetting techniques	5	Hr		
7.0	AQUIFFER TESTING				
7.1	Mobilization of test pumping	2	Lot.		
7.2	Installation of test-pumping unit & removal	1	Lot.		
7.3	Testing (Recovery Test)	6	Hr		
7.4	Water sample for chemical & physical analysis	1	Lot.		
7.5	Borehole head works complete - plinth	1	No.		
7.6	Temporary casings for the conductor pipe.	1	M		
7.7	Documentation Form WRMA 009A	1	No.		
Total Carried to Borehole Drilling Summary Page Page No. 4					

ITEM	DESCRIPTION	AMOUNT (KSH)
	<p data-bbox="236 353 687 387"><u>Borehole Drilling Summary Page</u></p> <p data-bbox="164 443 735 477">1.0 Total Brought forward from BQ Pg. 1</p> <p data-bbox="164 533 735 566">2.0 Total Brought forward from BQ Pg. 2</p> <p data-bbox="164 622 735 656">3.0 Total Brought forward from BQ Pg. 3</p>	
	Total For Borehole Drilling	

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.0	SUPPLY & INSTALLATION OF ELECTRIC WATER PUMP				
1.1	Borehole pump as Wilo, Grundfos or approved equivalent Capable of : Q = 15 m ³ /hr and H = 290 m. Note: Exact pump head and flow rate to be sized after depth of the borehole is determined.	1	No.		
1.2	Pump control panel; EDOL 15kw complete with PLAV	1	No.		
1.3	Pump TPN switch Fuse	1	No.		
1.4	Submersible cable 10mm ² x 4core flat	270	M		
1.5	10mm ² x 4core armoured cable	30	M		
1.6	Water proof cable joint	1	No.		
1.7	Electrode cable black	270	M		
1.8	Electrode cable brown	270	M		
1.9	Electrode probes	2	No.		
1.10	Borehole pipes 2.5" supa heavy 350m	84	No.		
1.11	Airline pipes	42	No.		
1.12	Adaptor set 2.5" super heavy	1	No.		
1.13	Cover sundries 2.5" x 6"	1	No.		
1.14	Water meter 2.5"	1	No.		
1.15	Earth rod 4ft	1	No.		
1.16	Earth clamp	1	No.		
1.17	6.0mmx 1 core cable green earth cable	5	M		
Total Carried to Borehole Equiping Summary Page Page No. 3					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.18	1.5mm x 2 core UG cable	30	M		
1.19	Installation accessories	1	Lot.		
1.20	Electrical works, testing & commissioning	1	Lot.		
1.21	Transport & lowering	1	Lot.		

Total Carried to Borehole Equiping Summary Page Page No. 3

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ITEM	DESCRIPTION	AMOUNT (KSH)
	<u>Borehole Equiping Summary Page</u>	
1.0	Total Brought forward from BQ Pg. 1	
2.0	Total Brought forward from BQ Pg. 2	
	TOTAL	
	<u>MAIN SUMMERY</u>	
1.0	Total for Borehole Drilling	
2.0	Total for Borehole Equiping	
	Total Carried to Form of Tender	-

TECHNICAL SPECIFICATIONS

(LIQUID PETROLIUM GAS)

SECTION 1 - SPECIFICATIONS

- SECTION 1 - SPECIFICATIONS..... 1
- SECTION 1A - GENERAL SPECIFICATIONS 1
 - 1. *Installations to Comply with This General Specification*.....1
 - 2. *Scope of the Installations*1
 - 3. *Statutory Obligations and Other Requirements*.....1
 - 3.1 Technical Standards 1
 - 3.2 Case of Conflict 1
- SECTION 1B - PARTICULAR SPECIFICATIONS 2

SECTION 1A – GENERAL SPECIFICATIONS

1. Installations to Comply with This General Specification

The Water treatment shall comply with this General Specification which details the intrinsic properties (including materials and workmanship) of the Installations in so far as it is not overridden by the Conditions, Particular Specification, Drawings and/or written instructions of the Engineer.

2. Scope of the Installations

This General Specification, Particular Specification, Tender Equipment Schedule and Drawings detail the performance requirements of the Installations. The Installations to be carried out in accordance with this General Specification shall include the design where specified, installation and supply of all materials necessary to form a complete installation including any necessary tests, adjustments, commissioning and maintenance as prescribed and all other incidental sundry components together with the necessary labour for installing such components, for the proper operation of the Installations.

3. Statutory Obligations and Other Requirements

3.1 *Technical Standards*

KEBS, BS, BS EN, ISO Standards, IEC Standards and Codes of Practice, etc. shall be deemed to include all amendments, revisions and standards superseding the standards listed herein, which are published before the date of first tender invitation for the Contract or the Nominated Sub-contract (as appropriate) unless otherwise specified.

3.2 *Case of Conflict*

The documents forming the Contract are to be taken as mutually explanatory of one another but in case of ambiguities or discrepancies the same shall be dealt with in accordance with the Conditions.

SECTION 1B – PARTICULAR SPECIFICATIONS

ELECTRO – MECHANICAL WORKS SPECIFICATION

The LPG Contractor shall submit to the Service engineer a detailed programme of the Installations within 3 weeks from the acceptance of his tender showing the intended method, stages and order of Installations execution in coordination with the building construction programme, together with the duration he estimated for each and every stage of the Installations. The programme shall include at least the following:

- (a) Dates for the placement of orders for equipment and materials;
- (b) Expected completion dates for builder's work requirements, i.e. when work site needs to be ready;
- (c) Delivery dates of equipment and materials to Site;
- (d) Dates of commencement and completion of every stage of the Installations in line with the building construction programme, i.e. each floor level and/or zone area;
- (e) Dates of documents/drawings submissions to relevant Government departments to obtain the necessary approvals;
- (f) Dates of requirement of temporary facilities necessary for testing & commissioning, e.g. electricity supply, water and town gas
- (g) Dates of completion, testing and commissioning; and
- (h) Short term programmes showing the detailed Installations schedules of coming weeks and months shall also be provided to the Engineer. Programmes shall be regularly updated to reflect the actual progress and to meet the obligations under the Contract.

In addition, detailed submission schedules for installation drawings, equipment and testing and commissioning shall be submitted to the Engineer for approval. The formats and information to be included in the schedules shall be as required by the Engineer.

BUILDER'S WORK

All builder's work including pipework openings or holes through building structure or partition walls; trenches, ducts and cutting; and all plinths, concrete bases, supports, ducts etc. required for the installation will be carried out as part of the building works by the Building Contractor at the expense of the Employer provided that the LPG Contractor has submitted full details of such requirements within a reasonable time to the Engineer for approval, so that due consideration may be given before the Building Contractor commences the building works in accordance with the building programme in the areas concerned.

After obtaining the said approval of the Engineer, the LPG Contractor is required to mark out at the relevant locations of the Site the exact positions and sizes of all such works and to provide detailed information of such works to the Building Contractor to facilitate him to carry out the builder's works as the Works proceed.

All 'cutting-away' and 'making-good' as required to facilitate the LPG Contractor's works will be carried out by the Building Contractor, except for minor provisions required for the fixing of screws, raw plugs, redhead bolts, etc. which shall be carried out by the LPG Contractor. The LPG Contractor shall mark out on Site and/or supply drawings of all 'cutting-away' to the Building Contractor within a reasonable time.

The LPG Contractor shall ensure that such works are essential for the execution of the Installations. In the event that any of such works is proved to be non-essential, unnecessary and/or abortive, the LPG Contractor shall bear the full cost of such works including but not limited to any unnecessary or incorrect cutting-away and making-good and all cost incurred in this connection are recoverable by the Employer from the LPG Contractor as a debt under the Contract or via the Building Contractor as if it is a debt liable to the Building Contractor under the Sub-contract as appropriate.

Upon completion of the builder's works by the Building Contractor, the LPG Contractor shall forthwith check and examine that all builder's works so executed have been completed in accordance with his requirements. If at any time it becomes apparent to the LPG Contractor that any builder's works completed by the Building Contractor does not comply with his requirements in any respect whatsoever, the LPG Contractor shall forthwith give notice in writing to the Architect and specify in details the extents and effects of such non-compliance in that notice. The LPG Contractor is deemed to have satisfied with the builder's works after a period of 14 days from the date of completion of the builder's works if the above notice is not served to the Engineer within such period. All additional

expenditure properly incurred and all loss suffered in this connection by the Employer in having such works re-executed and rectified shall be recoverable by the Employer from the LPG Contractor as a debt under the Contract or via the Building Contractor as if it is a debt liable to the Building Contractor under the Sub-contract as appropriate.

COORDINATION OF INSTALLATIONS

The LPG Contractor shall coordinate the Installations with those works of the Building Contractor and any other contractors and sub-contractors of the Building Contractor.

The LPG Contractor shall note that the Drawings supplied to him only indicate the approximate location of his Installations. He shall make any modification reasonably required of his programme, work sequence and physical deployment of his work to suit the outcome of work coordination or as necessary and ensure that all cleaning, adjustment, test and control points are readily accessible while keeping the number of loops, cross-overs and the like to a minimum.

The programme of Installations shall also be coordinated to the satisfaction of the Architect and adhere to the approved overall construction programme.

Any significant problems encountered during the coordination work, which are beyond the LPG Contractor's control shall promptly be reported to the Engineer for advice and/or decision.

COOPERATION WITH OTHER CONTRACTORS

The LPG Contractor shall cooperate at all times with the Building Contractor and all other contractors and sub-contractors of the Building Contractor in order to achieve efficient workflow on the Site.

Any significant problems beyond the LPG Contractor's control shall promptly be reported to the Engineer for advice and/or decision. No extra claim for delay either financially or extension of the Contract Period will be allowed if the LPG Contractor fails to properly and adequately co-ordinate and programme the work at all times.

SITE SUPERVISION

The LPG Contractor shall keep on the Site a competent and technically qualified site supervisor to control, supervise, co-ordinate and manage all his works on Site. The site supervisor shall be vested with suitable powers to receive instructions from the Engineer.

The site supervisor shall be technically competent and have adequate site experience for the Installations. The LPG Contractor shall also refer to the Particular Specification for other specific requirements, if any, on site supervision.

Approval by the Engineer shall be obtained prior to the posting of the site supervisor on Site. The LPG Contractor shall immediately replace any site supervisor whose experience, skill or competency is, in the opinion of the Engineer, found to be inadequate for the particular work.

The LPG Contractor shall implement a work permit system where work is required to be carried out on the installation in which LPG has been loaded. The LPG Contractor shall be responsible to take every fire precautionary measures. He shall also be responsible for putting up warning signs at prominent positions on site to warn other contractors of the existence of the inflammable gases.

SAMPLE BOARD

Within 3 weeks of the award of the Contract and prior to the commencement of installation work, the LPG Contractor shall submit to the Architect for approval in good time a sample board of essential components proposed to be used in the Contract. However, the LPG Contractor may request the Engineer in writing for a longer period for the submission, if 3 weeks are practically insufficient.

Items displayed shall deem to be adequate for the whole Installations unless otherwise clearly indicated. Each sample, with clear numbering and labelling, shall be firmly fixed onto a rigid wooden or metal board. A list shall also be affixed on the sample board to show the item description, make and brand, country of origin and locations of installation (if not generally used). Samples rejected by the Engineer shall be replaced as soon as possible. Upon approval of all items, the Engineer will endorse the list on the sample board and the LPG Contractor shall deliver the board to the site office for reference.

The following items shall be included in the sample board as a minimum. Additional items may be required by the Engineer and/or specified in the Particular Specification.

- a) pipework, fitting and support; and
- (b) flexible rubber hose and tubing.

ADVICE OF ORDER PLACED

The LPG Contractor shall submit copies of all orders placed for major items of equipment and materials to the Engineer for record.

RECORD OF MATERIALS DELIVERY

For the purpose of assessing interim payment, all materials delivered to Site shall be accurately listed and recorded in the site record books maintained by the Engineers' Representatives on Site.

Where the Building Contractor is in overall control of the Site, the Building Contractor may also be required to record details of all incoming/outgoing materials. In this case, the LPG Contractor shall comply with the Building Contractor's arrangements.

PROTECTION OF MATERIALS AND EQUIPMENT

Unless the responsibility is clearly defined in the Contract that the protection on Site for delivered equipment, materials and installation is solely by other contractors, the LPG Contractor shall be responsible for the safe custody of all materials and equipment as stored or installed by him. In addition, the LPG Contractor shall protect all work against theft, fire, damage or inclement weather and carefully store all materials and equipment received on Site but not yet installed in a safe and secure place unless otherwise specified.

All cases of theft and fire must immediately be reported to the police, the Building Contractor, the Engineer and the Engineer's Representatives on Site with full details.

Where necessary the LPG Contractor shall provide lockable steel container or other equally secure enclosures placed within a securely fenced-in compound provided by the Building Contractor on Site for the storage of materials and equipment.

The LPG Contractor shall co-ordinate and arrange with the Building Contractor who shall provide clean, reasonably finished and lockable secure accommodation for the storage of sensitive and/or expensive items before installation. If the Building Contractor fails to concede to the request, the LPG Contractor shall report the shortcomings of the accommodation to the Engineer.

If there is no Building Contractor, all the storage facilities and spaces shall be provided by the LPG Contractor.

DRAWINGS IN ELECTRONIC FORMAT

The LPG Contractor shall provide drawings in electronic format as required in the following clauses. These drawings shall conform to the latest version of CAD.

INSTALLATION DRAWINGS

Drawing Submission Schedule

The LPG Contractor shall submit a detailed installation drawing submission schedule and programme to the Engineer. The LPG Contractor shall allow reasonable time in the programme for vetting of the installation drawings by the Engineer and for drawing resubmissions as necessary.

The LPG Contractor shall submit to the Engineer a comprehensive "Submission Schedule" of installation drawings and builder's work drawings within 2 weeks after the acceptance of tender, taking into account of the overall programme of the Installations including any Specialist Works and works by the utility undertakings. No equipment shall be delivered to the Site and no works shall be executed until the installation drawings have been approved by the Engineer. The LPG Contractor shall ensure that the installation drawings and builder's work drawings are progressively submitted in accordance with the approved "Submission Schedule".

The LPG Contractor shall provide at least 6 hard copies and one electronic copy, unless otherwise specified in the Contract, of the approved installation drawings to the Engineer for distribution.

Size of Installation Drawings

Drawings submitted by the LPG Contractor shall only be of standard sizes from A0 size as stipulated in ISO 5457/Amd1:2010.

Contents of Installation Drawings

The LPG Contractor shall ensure all installation drawings are accurate representation of the Installations, before submitting them to the Engineer. All installation drawings shall be fully dimensioned and suitably scaled showing construction, sizes, weights, arrangements, operating clearances and performance characteristics.

Installation drawings including manufacturer's shop drawings shall be prepared and submitted to the Architect for perusal by the LPG Contractor in sequence with the Building Contractor's construction programme. They shall contain plan layouts, sectional drawings (elevations and plans), vertical schematic line diagrams, schematic wiring diagrams, installation details, etc. and shall show the following particulars:

- (a) Service routings and levels relative to the structure and other services;

- (b) Plant and equipment locations with dimensions and weights; and
- (c) Service joints, supports and fixing details together with their locations.

Maintenance accesses, facilities and all necessary details relating to the proper operation and maintenance of the systems.

Builder's Work Drawings

Unless otherwise approved by the Engineer, the LPG Contractor shall submit to the Architect in accordance with the approved "Submission Schedule", 6 copies of drawings showing details of all builder's work required e.g. the weight and the load on each support of equipment. Such drawings shall clearly indicate the details and positions of all holes, trenches, ducts and cutting required and construction details for plinths and equipment bases.

Manufacturer's Shop Drawings

The manufacturer's shop drawings are drawings for equipment or plant to be manufactured by a specialist manufacturing supplier in their own workshops and places away from the Site.

The drawings shall show detailed construction, principal dimensions, weights and clearances for maintenance, etc. Immediately after placing of any order or at any event within 4 weeks unless otherwise approved in writing by the Architect, the LPG Contractor shall forward to the Engineer for comment, 4 copies of manufacturer's shop drawings, indicating detailed construction, principal dimensions and weights, clearances for withdrawals and/or cleaning, etc. No work shall proceed on or off the Site unless drawings requiring approval are so approved in writing by the Engineer.

AS-BUILT DRAWINGS

Submission of As-built Drawings

The LPG Contractor shall submit 3 sets of the first draft prints of as-built drawings within 28 days of the issuance of the certification of completion. The Engineer after checking the above draft prints shall return one set of the marked up copies of these as-built drawings to the LPG Contractor within 42 days from the date of submission of the LPG Contractor's draft prints with comments. The LPG Contractor shall within a further 28 days from the date of receiving the Engineer's comments on the draft as-built drawings re-submit to the Engineer for his approval another 3 sets of the second draft prints of as-built drawings with the Engineer's comments incorporated. This process of submission and approval

shall continue until the final approval of the Engineer on these as-built drawing is obtained.

The final approved as-built drawings shall be in 3 sets of hard copy and 3 sets of electronic copies. These shall be submitted within 21 days from the date of final approval. Each electronic copy shall be in the form of CD-ROM, labelled, with cross reference to a printed list of files explaining the contents and purpose of each file and supplied in sturdy plastic containers.

The detailed requirements and the media of as-built drawings set out in the Preliminaries of the Bills of Quantities or the Specification Preliminaries shall be followed as appropriate.

Size of As-built Drawings

As-built drawings shall only be of standard sizes of A0 size as stipulated in ISO 5457/Amd1:2010. Smaller size (A2 to A4) is accepted for installation drawings.

Content of As-built Drawings

The LPG Contractor shall ensure all as-built drawings are accurate representation of the Installations, before submitting them to the Engineer.

Contractor for various types of BS/E&M installations shall include, but not limited to the followings:-

- (a) Building services layout plans such as ducting arrangement, trunking arrangement, piping arrangement, etc.;
- (b) System schematic diagrams, control diagrams and wiring diagrams;
- (c) Concealed work layout plan such as concealed conduit routing, etc.; and
- (d) Installation details and assembly drawings such as bulk LPG vessel, LPG vaporizer, etc.

OPERATION AND MAINTENANCE (O&M) MANUAL AND USER MANUAL

General

The LPG Contractor shall provide two types of manuals to the Engineer with all changes made to the installation during the course of the Contract suitably incorporated.

The O&M Manual is for use by the maintenance agent of the completed installation. It shall contain detailed technical information covering both operation and maintenance aspects of the installation.

The User Manual seeks to enable the user of the completed installation an overview of the essential information of the installation. The contents of the manual should be concise and succinct for ease of comprehension by people with a non-technical background.

Checking and Approval

The LPG Contractor shall supply 3 sets of the first draft of O&M Manuals together with a list of recommended spare parts for one year's operation and a list of special tools, both complete with prices to the Engineer for comment at least 56 days prior to the testing and commissioning of the plant and equipment or within 28 days of the issuance of the certification of completion.

The LPG Contractor shall submit 3 sets of the first draft of the User Manual to the Engineer for comment at least 56 days before the date of completion.

The Engineer will check the drafts and return them to the LPG Contractor within 42 days from the date of submission by the LPG Contractor with comments necessary for final and approved set of document. The LPG Contractor shall then make all necessary amendments to the documents and resubmit them to the Engineer within 21 days from the date of receipt of comments.

The LPG Contractor shall submit 3 sets of hard copies (one of which shall be the original) and one set of electronic copy of the final approved O&M manuals in CD-ROM, labelled, with cross reference to a printed list of files explaining the contents and purpose of each file and supplied in sturdy plastic containers, within 21 days from the date of approval by the Engineer.

Structure and Content of O&M Manual

The detailed requirements, structure and contents of the O&M manual shall be as specified in the Contract Preliminaries or shall include the following information under separate sections where appropriate:

(a) Project Information

The following information shall be included:-

Project title, site address, contract no., contract title, LPG Contractor/sub-contractor name, address, contact persons and their telephone/fax nos.,

contract commencement date, substantial completion date and end date of maintenance period.

(b) System Description

- (i) Type(s) of system(s) and equipment installed;
- (ii) Design criteria, design data and parameters;
- (iii) Locations of the system and major equipment, and what they serve;
- (iv) Description of operation and functions of the system and equipment; and
- (v) General operating conditions, expected performance and energy and resources consumption where applicable

(c) List of Installed Equipment

Schedule of all items of equipment and plant stating the location, name, model no., manufacturer's serial or reference no., manufacturer's design duties and data.

(d) Spare Parts and Special Tools Lists

- (i) List of Spare Parts supplied by LPG Contractors:

Item descriptions, supplied quantities, model nos., manufacturer's serial or reference nos. and storage locations.

- (ii) Recommended Spare Parts List and Special Tools List:

Manufacturers'/suppliers' recommendations for spare parts and special tools with item description, unit rate, recommended stock quantities as well as the agents for the spare parts and special tools.

(e) Safety Precautions for Operation & Maintenance

State, where applicable, hazard warnings and safety precautions of which the operation and maintenance staff need to be aware:

- (i) mandatory requirements relating to safety;
- (ii) known hazards against which protection measures shall be taken; and

(iii) known features or operational characteristics of the installed equipment or systems which may cause hazard and the related safety precautions

(g) Operation Instructions

Instructions for the safe and efficient operation, under both normal and emergency conditions, of the installed system which shall comprise :

- (i) an outline of the operating mode;
- (ii) control logic and data (sequence, effect, limits of capability, modes and set points);
- (iii) procedures and sequences for start-up and shut-down;
- (iv) interlocks between equipment/system;
- (v) calling on of stand-by equipment;
- (vi) precautions necessary to overcome known hazards;
- (vii) means by which any potentially hazardous equipment can be made safe;
- (viii) estimation of energy consumption and energy costs;
- (ix) forms for recording plant running hours, energy consumption and energy costs; and
- (x) operating data such as running current, operating pressure, operating flow rates etc.

(h) Maintenance

(i) Maintenance instructions

Manufacturers' and LPG Contractor/ subcontractor's recommendations and instructions for the maintenance of the installed equipment. In particular, the detailed requirements of periodic test and examination of vaporisers for ascertaining their fitness for use to vaporize LPG shall be submitted. Clear distinction should be made between planned tasks (preventive maintenance) and fault-repair tasks (corrective maintenance). Instructions shall be given on each of the following, as appropriate:

- nature of deterioration, and the defects to be looked for;
- isolation and return to service of plant and equipment;
- dismantling and reassembly;
- replacement of components and assemblies;
- dealing with hazards which may arise during maintenance;
- adjustments, calibration and testing; and
- special tools, test equipment and ancillary services

(ii) Maintenance schedules

Proposed maintenance schedules for all the preventive maintenance tasks identified above. The schedules shall be based on both manufacturers' recommendations and other authoritative sources (e.g. statutory or mandatory requirements) and shall include :

- routine servicing;
- inspections;
- tests and examinations;
- re-painting of pipework;
- replacement of items of specified durability or service life;
- adjustments;
- calibration; and
- overhaul.

The frequency of each task may be expressed as specific time intervals, running hours or number of completed operations as appropriate. Collectively, the schedules will form a complete maintenance cycle, repeated throughout the whole working life of the installation.

(i) Drawing Lists

- (i) A complete list of as-built drawings identified with drawing number/reference;

(ii) A complete list of manufacturers' shop drawings with drawing number/reference, where applicable; and

(iii) A brief description of CD-ROM for these drawings.

(j) Technical Literatures

A complete set of manufacturers' literatures for all the plant and equipment installed in the system. The contents of these literatures shall cover the following areas where applicable: Edition

(i) description of equipment with model numbers highlighted;

(ii) performance - behavioural characteristics of the equipment;

(iii) applications - suitability for use;

(iv) factory/laboratory test reports, detailed drawings, circuit diagrams;

(v) methods of operation and control;

(vi) operation instructions;

(vii) cleaning and maintenance requirements;

(viii) plants, materials and space required for maintenance;

(ix) protective measures and safety precautions for operation & maintenance; and

(x) part lists.

(k) Contact addresses and telephone numbers of suppliers of major equipment.

TRAINING OF EMPLOYER'S STAFF

The LPG Contractor shall provide adequate training to the Employer's staff at completion of the Installations after commissioning of the installation until they are fully familiar with the operation, routine testing and maintenance of the installation.

The training shall include all training facilities, material and handouts etc. The LPG Contractor shall submit a training schedule and proposal at least 2 months prior to completion of the Installations for the Engineers's Approval.

SPARES AND TOOLS

The LPG Contractor shall also supply all the spare parts and special tools required for the whole Maintenance Period for operation and maintenance of the plant and installation. All consumable parts except fuel and water supply shall be included.

Unless otherwise specified, the LPG Contractor shall submit before the certified completion date of the Installations a price list for itemized spares and consumables pertaining to all the equipment offered as recommended by the manufacturers for a period of one year's operation and maintenance following the completion of the Contract's Maintenance Period. The prices listed shall be fixed and open for acceptance up to the end of the maintenance period.

In addition, the LPG Contractor shall submit before the certified completion date of the Installations a complete list of all the replaceable parts with model number, part number and price which shall be for purchase and use after the expiration of the Maintenance Period. The list shall be complete with suggested prices.

QUALITY ASSURANCE STANDARDS

The LPG Contractor in supplying a specific item of equipment or appliance, whether specified herein by name or whether of a make selected by the LPG Contractor, shall be deemed to warrant its satisfactory performance under all local working conditions.

In the event of anything described in the Specification or shown in the tender drawings being, in the LPG Contractor's opinion, unsuitable for or inconsistent with the LPG Contractor's guarantee or responsibilities, the LPG Contractor shall draw the Architect's attention thereto at the time of tendering.

STORAGE VESSELS

Vessels shall be designed and constructed of steel in accordance with a recognised Pressure Vessel Code such as PD 5500:2009 + A2:2010, AS1210:2010, or ANSI/ASME Boiler and Pressure Vessel Code Section VIII or equivalent. The LPG Contractor shall be responsible to obtain the approval from the Gas Authority and submit the manufacturer's test certificates to prove that these standards have been fully complied with. Use of partial standards shall not be allowed.

Vessels shall be post-weld heat treated in accordance with the respective design codes and shall be subject to 100% radiography examination and a satisfactory “charpy” test at minimum design temperature.

Bulk tanks shall be designed to minimum pressure of 1.725 MPa and a minimum design temperature of -10 °C.

Each vessel shall be provided with a permanently fixed and clearly visible data plate that shall include as a minimum the following information:

- (a) the Pressure Vessel Code;
- (b) the manufacturer’s name and serial number;
- (c) the water capacity in kilolitres;
- (d) the maximum working pressure in kPa;
- (e) the date of manufacture;
- (f) design temperature range in °C - minimum and maximum;
- (g) date of test, pressure applied, inspection authority, and its symbol;
- and
- (h) provision of sufficient space for subsequent re-test marking

Horizontal vessels shall be sloped slightly towards the drain connection; alternatively the liquid withdrawal connection shall be at a slightly higher level than the drain connection.

Vessels exceeding 5000 litres water capacity shall have a manhole of minimum diameter of 450 mm. The manhole in the form of extruded nozzles shall be of not less than 550 mm internal diameter.

In addition to inlet and outlet connections, each bulk storage LPG vessel shall be provided with at least one of each of the following fittings:

- (a) pressure relief valve connected directly to the vapour space;
- (b) plugged shut-off valve for connection;
- (c) a fixed maximum liquid level device and a contents gauge;
- (d) a pressure gauge connected to the vapour space; and
- (e) a suitable earthing connection.

All fittings on vessel or mounded tank shall be accessible above ground level and shall be either on the manholes or on welded extensions.

PRESSURE RELIEF VALVES

Pressure relief valves shall be of tamper-proof, direct spring loaded type, and designed to start to discharge and attain full flow at pressure in accordance with the Pressure Vessel Code of the vessel. Weight loaded relief valves shall not be used. The pressure relief valve shall have the following information stamped on the valve or on a separate metal plate securely fixed to it: -

(a) the manufacturer's identification including name and catalogue or type number; and

(b) the start to discharge pressure. Space shall be provided on the valve or the metal plate for subsequent stamping of periodic retest dates.

In the case of multiple pressure relief valves, provision made for isolating any one relief valve for testing or servicing shall ensure that the remaining relief valves provide the full capacity. In the case of vessels fitted with single relief valves, provision shall be made for their removal for testing or servicing by the use of an automatic shut-off valve which shall be fully open by the presence of the relief valve and shall close before the relief valve is completely removed.

VENT PIPES

For all underground vessels or mounded tanks, the relief valves shall be fitted with vent pipes adequately supported and having outlets at least 2 m above the top of the vessels to which they are fitted and at least 3 m above ground level. Vent pipe outlet shall be located away from fixed sources of ignition at a minimum distance of 4.5 m.

Vent pipes shall be designed for the full flow characteristic of the relief valves, to allow for drainage of water and to ensure that in the case of ignition of discharging products, flame impingement on the vessel or on any adjacent vessels, piping or equipment is avoided.

Vent pipes shall be provided with loose fitting captive rain caps.

SHUT OFF VALVES AND EMERGENCY VALVES

All liquid and vapour connections on vessels other than those for relief valves, plugged openings and those where the connection through the vessel shell is not greater than 1.4 mm, shall have fire resistant shut-off valves conforming to BS EN 12266-1:2003 and BS EN 12266-2:2002 or ANSI/ API Std 607:2010 or equivalent, capable of manual operation located as close as practicable to the vessel. Particularly, liquid and vapour withdrawal connections shall be fitted with shut-off valve completed with integral excess flow valves. Filling connection shall be fitted with shut-off valve and check valve.

Other connections to the vessel greater than 3 mm diameter for liquid and 8 mm diameter for vapour with the exception of those for relief valves and drain connections shall also be protected with an emergency valve.

Remotely controlled emergency valve shall be provided for large size connections of 40 mm or above. The emergency valve manual control shall be operated from a safe area and be of the "fail-safe" type.

FILLING CONNECTIONS

All filling connections of a storage vessel shall be equipped with:

- (a) an emergency valve, e.g. an excess flow valve, back check valve; and
- (b) a shut-off valve preferably capable of manual operation.

Filling connections shall be easily accessible, preferably within the storage fenced area, and as close to the vessel as is practical, but not directly underneath.

Filling connections shall be located so that the safe positioning of the delivery vehicle and its quick removal in an emergency are facilitated.

Offset/Remove filling connections including vapour returns, shall be clearly labelled "liquid" or "vapour" as appropriate and shall terminate about 1 m above ground and shall allow a horizontal connection to be made with the delivery hose(s).

DRAIN CONNECTIONS

Drain connections designed to permit drainage to atmosphere shall be provided with a shut-off valve which is preferably not more than 50 mm nominal size.

The outlet of the drain valves shall be provided with a length of piping terminating with second shutoff valve, preferably not more than 25 mm nominal size. A sufficient length of piping shall be provided downstream of the second

valve to ensure that discharge will not take place beneath the vessel. The drain valve adjacent to the vessel connection shall be quick action type.

No drain or blow-off line shall discharge into or be in the proximity of any public drainage system or any other drainage system where this would be liable to create a hazard.

The outlet of the drain valve system shall be blank-flanged, plugged or otherwise secured against tampering when not in use.

Pipework between the drain system valves and between any valve and a blank-flange or plug etc. shall be protected by hydrostatic pressure relief valve.

GAUGES

The content gauges shall clearly indicate whether they read in % water capacity, % rated LPG capacity or actual contents in litres, tonnes, etc. Each bulk tank shall be equipped with at least two gauges for indicating the quantity of content, one of which shall be of a fixed liquid level type.

Any content gauge which relies on bleeding to atmosphere shall be such that: -

- (a) The bleed hole maximum opening is not larger than 1.4 mm otherwise it shall be protected by a shut-off valve and a suitable emergency valve;
- (b) It shall not be completely withdrawn in normal gauging operation; and
- (c) The gland shall be capable of being repacked without withdrawing the vessel from service.

The setting of the maximum level devices shall be suitable for the grade of LPG being stored and shall indicate a maximum product level for the designed usage at a temperature of 42.5 °C.

Temperature gauges shall be of the indirect type comprising pockets merged in contact with the vessel contents.

Pockets of temperature gauges shall be in the form of blind tubes suitable length, oil filled, permanently welded to the vessel and constructed in accordance with the Pressure Vessel Code of the vessel.

Pressure gauges shall be provided for all fixed storage vessels and connected to the vapour space of the vessel and easily readable from ground level. Pressure gauge mounting connection shall be protected either by a tapping reduced internally to a bleed hole not larger than 1.4 mm or by a suitable excess flow valve and shut off valve.

STEEL PIPES

All liquid pipelines shall be Schedule 80 seamless steel pipes conforming to BS EN 10216-1:2002, BS EN 10217-1:2002 or ANSI/ API Spec 5L: 2007, and of a design working pressure of 2.75 MPa.

All vapour pipelines at high pressure stage shall be Schedule 80 seamless steel pipe conforming to BS EN 10216-1:2002, BS EN 10217-1:2002 or ANSI/ API Spec 5L: 2007 or ASTM A53/ A53M-10:2010 or equivalent.

All vapour pipelines at medium pressure stage and below shall be of heavy grade steel construction and conform to BS EN 10255:2004 or ISO 65:1981 heavy grade or equivalent.

PIPE JOINTS

Joints in steel pipes of 50 mm nominal bore and smaller shall be welded, or where approved flanged or screwed. Steel pipe joints over 50 mm nominal bore shall be welded, or where approved welded flanged. LPG pipes shall be of welded construction as far as practicable. LPG pipes of flanged or screwed construction shall have the prior approval of the Engineer before installation.

Jointing of steel pipes by electric arc welding shall be in accordance with BS 2971:1991 shall be used on pipes of 15 mm nominal bore or larger.

Jointing compounds for screwed connections shall be resistant to LPG and shall comply with BS 6956-1:1988, BS 6956-5:1992, BS EN 751-1:1997 and BS EN 751-2:1997. The use of PTEE tape is preferable but lead or hemp shall not be used.

All underground LPG pipe joints shall be welded unless otherwise approved by the Engineer. Flanged connections shall be kept to a minimum.

PIPE FITTINGS

Steel flanges and flanged fittings shall be to ANSI/ ASME B 16.5-2009 or BS EN 1759-1:2004 on liquid lines or vapour lines at high pressure stage. Flanges on vapour lines operating at medium pressure stage or below shall conform to BS EN 1515-1:2000, BS EN 1092-1:2007. Bolting shall comply with BS EN 1515-1:2000, BS EN 1515-3:2005 or BS 4882:1990 or the equivalent of applicable codes.

Steel butt-welded fittings shall be to BS EN 10253-1:1999 or at least the same schedule thickness as the pipes for use at high pressure stage.

Steel socket-welded and screwed fittings and screwed coupling shall be to BS 3799:1974 or equivalent standard for use at high pressure stage.

Screwed fittings for use with steel pipes to BS EN 10255:2004 or ISO 65:1981 on vapour lines operating at medium pressure or below shall conform to BS 143 & 1256:2000 or BS EN 10241:2000 or the equivalent of applicable codes.

Gaskets shall be resistant to LPG and natural rubber shall not be used.

Screwed union or compression fittings for piping installation within LPG compound and cylinder store shall be avoided and shall not be used without the prior approval of the Engineer.

ALLOWABLE PRESSURE DROPS

Piping shall be sized that the pressure drop along the medium pressure stage shall not exceed 7 kPa, and that along the low pressure stage shall not exceed 0.15 kPa.

PIPING INSTALLATION

Only lateral pipework inside the premises feeding the gas appliances may be allowed to be buried in floor slab. They shall be protected against corrosion and mechanical damage. Installation risers shall be carried external to the building and exposed or may be enclosed in ducts complying with BS 8313:1997.

All pipework shall be properly supported with strong hangers, anchors, brackets, saddles, guides etc. Pipe supports shall be arranged as near as possible to joints and changes of direction and each support shall take its share of load.

Supports for steel pipes shall be of mild steel, malleable iron or galvanised steel. Copper pipes shall be fixed by gunmetal or brass pipe clip. Brackets screwed to walls shall be secured by expanding plugs or other approved methods. The top half of the pipe clip shall be detachable without disturbing the fixing.

Vertical pipe risers shall be adequately supported at the base to withstand the total weight of the risers and shall be protected against mechanical damage to a minimum height of 2 metres from ground level.

All vertical and horizontal pipe runs shall have adequate flexibility and facilities to compensate for thermal expansion and contraction of pipes, or mechanical stress at branch pipes.

Insulation shall be provided in the pipe support for those sections of piping where cathodic protection has been provided.

All pipes shall be thoroughly cleaned and wire brushed to remove all grease, dirt, rust, scale, and other defects before installation; and shall be protected against corrosion by wrapping, galvanising or painting as appropriate.

During the installation work in progress, all open ends of the pipework shall be blanked off with purposely made plugs or caps to keep foreign matters from entering the finished system.

Pipework laid in floor slab shall be protected by factory-bonded sheath or wrapping. The piping shall be covered to a depth of not less than 12 mm. The channel shall be cleaned of all debris, sharp edges, rubbish and surplus moisture before the pipe is embedded.

Pipework passing through wall or floors of a building, shall be wrapped and enclosed in metal sleeve for complete length through the walls or floors and sealed with a non-combustible sealing agent at both ends. The annular space between the sleeve and the pipe shall be of sufficient width to allow for the maximum movement of the pipe due to thermal expansion and contraction. No joint shall be located within the sleeve. The sleeve shall be of same material as the LPG piping. Where sleeve passes through a floor that may be wetted or a wall on which water or corrosive material may condense, the sleeve shall project at least 25 mm beyond the floor or wall finished surfaces.

A minimum clearance of 150 mm shall be maintained between the LPG pipe and electric conduits or cables.

Pipework buried underground shall be adequately protected against corrosion and mechanical damage. Pipework shall be treated with two coats of bituminous paint and wrapped with corrosion and water resistance self-amalgamating tapes and mastics, or other equal and approved wrapping for protection against corrosion. The pipeline channel shall be cleaned of all debris, rubbish and surplus moisture, and the pipe shall be supported to ensure that it is completely surrounded by crack free mortar.

Underground pipework outside the premises shall be buried at a depth of not less than 800 mm. In the case where gas pipes and underground electric cables are running in a common trench, a minimum clearance of 200 mm shall be maintained between the two services. Pipe markers shall be fixed to indicate the route of the buried pipelines.

Underground pipework at road crossing shall have sufficient mechanical protection to prevent crushing. The LPG Contractor shall submit the detail of protection for approval before installation.

GAS DETECTION

Gas leakage or suspected gas leakage shall be checked by the use of a gas detector.

INSTRUCTION, LABELS, SIGNS AND NOTICES

Adequate and appropriate identification labels, emergency instructions, warning signs and line diagrams shall be provided.

The LPG Contractor shall provide “NO SMOKING”, “LPG HIGHLY FLAMMABLE” and “LPG STORE” signs in 120 mm minimum English and Chinese characters and shall prominently display them on or adjacent to each point of entry to the LPG installation.

At the bulk storage vessels, at least TWO sets of the above mentioned signs shall be provided. The warning signs shall be made of sandwich plastic material with white outer layers and a black or red inner layer as required. Lettering shall be engraved on the plastic material by cutting away one of the outer layers to outline the required letters, and exposing the inner underneath. Details shall be submitted to the Architect for approval prior to engraving.

The LPG Contractor shall provide and install adequate warning signs, emergency notices, operating instructions and framed schematic and line diagram in accordance with the requirement of the Gas Authority.

The LPG Contractor shall identify all LPG piping with a colour band in accordance with BS 1710:1984. The basic identification colour shall be yellow ochre with black letters and signs on top to show the word “LPG”, the “liquid” or “vapour” phase where the piping are inside the storage compound and the direction of flow.

All emergency control/valves shall be labelled to show their ON and OFF positions. The label may be in the form of a continuous roll of self-adhesive material or a permanent notice clearly marked “LPG Emergency Valve” and prominently displayed near such control/valves. Similarly, a permanent notice marked “LPG Main Control Valve” for the LPG main control valve outside the building shall also be provided.

Operating instructions shall be provided at appropriate locations to ensure safe, continuing and reliable operations. The operating instructions shall be made on a durable material and be properly fixed.

Labels shall be provided to all pipeworks, valves, electric circuits, indicators, cables, and all other equipment to facilitate operation and proper maintenance of the installation.

Labels and notices required by statutory requirements shall be inscribed accordingly whereas other labels shall indicate name and purpose of the equipment together with ratings where applicable. All labels shall be in both Chinese and English.

Labels and notices shall be fixed by screws. Where drilling and tapping is impracticable, approved adhesive may be used subject to prior approval by the Architect.

Warning notice sufficiently durable and legible throughout the life of the equipment shall be fixed in a prominent position drawing the attention of the operator to any potential hazard.

LPG COMPOUND

To prevent trespassing or tampering, the LPG compound which houses the underground or mounded storage vessels, vaporisers, regulators, etc. shall be enclosed by fence with two means of exit preferably positioned at opposite end of the compound. The fence shall be of industrial type, at least 1800 mm high and perforated to maintain good ventilation. The solid concrete kerb for supporting the perforated fence shall form a bund to a height of not less than 150 mm and not be higher than 380 mm above finished floor level.

The floor of the LPG compound shall be concreted and those parts underneath the underground or mounded storage vessels shall be sloped. The vicinity of the vessels shall also be free from pits and depressions other than those necessary for drainage or the containment of spillage.

Water drains, where provided, shall be of the U shape with water seal preferably situated well away from the storage area.

A sterile area of at least 1m shall be provided and paved with concrete around the LPG compound and conspicuously marked with yellow lines on the floor.

TRENCHES

Trenches for underground pipe installations shall have a minimum depth of not less than 800 mm. There shall be no pebble or small stones at the bottom of the trench. Electric cables and other services are not permitted to share the same trench.

WALLS, CEILING OR FLOORS

Sleeves of the same material of the LPG piping shall be embedded in holes for the whole length through walls or slabs. Wall, ceilings, roofs and doors shall be

designed such that if imperforated, they shall be capable of withstanding a static pressure of at least 4.8 kPa.

After the installation work is completed, the LPG Contractor shall test and commission the whole installation for proper and safe operation.

INSPECTION, TESTING AND COMMISSIONING

The testing and commissioning of the installation shall be carried out by Competent Persons of the LPG Contractor according to the Specification and the manufacturer's instruction and manuals. The LPG Contractor shall follow relevant approved standards, procedures, guidelines in the testing and commissioning works. They shall include but not limited to:

- (a) Statutory Obligations and other requirements, Specifications and Standards.
- (b) Detailed inspection, testing and commissioning methods and procedures approved by the Engineer;
- (c) Manufacturers' recommendation and specifications; and
- (d) Test requirements under various standards including British Standards, European Standards, ISO Standards and other International Standards on Liquefied Petroleum Gas Installation.

The LPG Contractor shall submit detailed testing and commissioning procedures and programme for approval by the Architect prior to the testing and commissioning of the LPG installation. The procedures include all the requirements in LPG_TCP with other additional requirements for the installation.

The LPG Contractor shall carry out safety test and functional test for the installation. The LPG Contractor shall commission the installation and carry out complete performance tests for all equipment and systems installed by him in accordance with the manufacturer's instructions, the requirements of the statutory rules and regulations and to the satisfaction of the Architect. The tests shall include, but not limited to:-

- (a) factory tests where required;
- (b) visual inspection and checking;

- (c) safety tests;
- (d) commissioning, tuning and adjustment;
- (e) functional tests; and
- (f) performance tests.

To ensure that all the equipment/ fittings are provided to specifications, allow for factory visits to the manufacturing factories to witness all the relevant factory tests and conduct inspections before approval of shipping is given. Note that the client's and consultants' travel and allowances are catered for by the client. The contractor shall however facilitate the visa processing by arranging for invitation letters and any other necessary items required for this travel.

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
A	Allow for mobilization, tools and all necessary equipment on site	1	Item		
B	Allow for co-ordination of works with the Main Contractor and other Sub-contractors.	1	Item		
C	Arrangement for all inspections and tests of the installation that may be required by the Engineer/Client and shall provide all instruments and equipment required for these tests.	4	Item		
D	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	1	Item		
E	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works.	1	Item		
F	Allow for on-site Training of the Operators for specialised equipment	1	Item		
G	Allow for all the conditions relating to this contract as specified	1	Item		
H	Allow for all the necessary government and county approvals	1	Item		

Total Carried to LPG Summary Page Page No. 6

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ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.1	<p>LPG Installations Supply, inatall & Comission</p> <p>All equipment, components and installations to be to BS 4250:1997, BS 5482-1 and to UKLPG codes of practice COP 1, COP 2, COP 3, COP 22 and to local standards and codes of practice.</p> <p>Pipework & Fittings</p> <p>Suppy , Fabrication, Installation, Testing and Commissiong of Black Iron (B.I) pipe schedule 40 with the required fittings (elbows etc) except branch Tees for LPG. Jointing shall be by flanged or welded joints of the following diameters. All pipework shall be painted with two (2) coats of zinc based primer and a final coat of lemon yellow as per specification.</p>				
1.2					
1.2.1	B.I 50Ø	300	M		
1.2.2	Ditto 40Ø	100	M		
1.2.3	Ditto 32Ø	300	M		
1.2.4	Ditto 25Ø	180	M		
1.3	Tees/ Elbows/Unions				
1.3.1	Ditto 50Ø	4	No.		
1.3.2	Ditto 40Ø	3	No.		
1.3.3	Ditto 32Ø	50	No.		
1.3.4	Ditto 25Ø	60	No.		
Total Carried to LPG Summary Page Page No. 6					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.4	Reducers				
1.4.1	B.I 50Ø x 40Ø	2	No.		
1.4.2	Ditto 50Ø x 32Ø	2	No.		
1.4.3	Ditto 40Ø x 32Ø	6	No.		
1.4.4	Ditto 40Ø x 25Ø	2	No.		
1.4.5	Ditto 30Ø x 25Ø	4	No.		
1.4.6	Ditto 25Ø x 15Ø	20	No.		
1.5	Isolation Gas valves				
1.5.2	Ditto 50Ø	4	No.		
1.5.3	Ditto 40Ø	3	No.		
1.5.4	Ditto 32Ø	8	No.		
1.5.5	Ditto 25Ø	6	No.		
1.6	Gas Solenoid valve				
	Allow for the installation of a 15mm ø normally Open Solenoid valve ,configured with gas leak detector in each kitchen,Power supply 230 VAC/50HZ.	4	No.		
1.7	Flanges				
1.7.2	Ditto 50Ø	4	No.		
1.7.3	Ditto 40Ø	4	No.		
1.7.4	Ditto 32Ø	40	No.		
1.7.5	Ditto 25Ø	32	No.		
1.7.6	Hex Nippals 15Ø	40	No.		
Total Carried to LPG Summary Page Page No. 6					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.7	LPG Tank 1.5 Tonne Horizontal L.P.Gas Storage Tank complete with L.P.Gas,as 'Model Mobil' or other equal and approved.To complete with Filing valve,Magnetic float gauge,Muulti-valve and 1st stage Automatic L.P.Gas Regulator all housed under a lockable-hinged cover, Cathodic protection ,Safety Relieve Valve,Drain Plug,Main Isolating Valve Lifting Lung and Mounting feet,including all other necessary accessories for the proper functioning of the entire system and to approval. Allow for full tank LPG first fill.	2	No.		
1.90	LPG Leak detector Panel				
1.9.1	Lpg leak detector panel with remote sensors	1	No.		
2.0	80Kg/hr vaporiser with Rotary lpg meter	1	No.		
3.0	Installation clips, hangers,rods etc	1	item		
4.0	Domestic pressure regulating & Meter Box with accessories. Meter to be BMS compatible	2	No.		
Total Carried to LPG Summary Page Page No. 6					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
6.0	Gas leak detectors, TS 292 Geca model				
6.1.1	Remote gas leak sensors configured with central panel, cable of relaying alarm signal at the lowest threshold of gas leak at 10% gas leak.To be installed in the ducts and along the gas line to monitor any gas leak.	30	No		
7.1.2	Allow for shielded Fire Proof 1.5mm ² 3 core Cables for above system electrical connection.	1000	Lm		
6.1.3	Lpg Siren - Piezoelectric modulated siren with flashing red light indication,configured with central panel. Power supply by Control Panel.	1	No		
6.1.4	15mm ø normally Open Solenoid valve ,configured with gas leak detector in each kitchen,Power supply 230 VAC/50HZ.	4	No		
Total Carried to LPG Summary Page Page No. 6					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
	<u>LPG SUMMARY PAGE</u>				
1.0	Total Brought Forward From Page 1				
2.0	Total Brought Forward From Page 2				
3.0	Total Brought Forward From Page 3				
4.0	Total Brought Forward From Page 4				
5.0	Total Brought Forward From Page 5				
Total Carried to Meccahnical Summary Page SM/1					

TECHNICAL SPECIFICATIONS
(WASTE WATER TREATMENT PLANT)

1.1	TECHNICAL SPECIFICATIONS (WWTP)	3
1.1.1	General specification - general requirements	3
1.1.2	Basic Data on Raw Waste Water (Sewage)	3
1.1.3	Treated Waste Water Quality	3
2.1	THE TREATMENT PLANT (STP)	3
3.1	DESIGN CRITERIA	4
4.1	AUTOMATION OF SYSTEM	5
5.1	SCOPE OF CONTRACT & DESCRIPTION OF WORK	5
5.1.1	Scope of Contract	5
5.1.2	Details of civil works	6
5.1.3	General	6
5.1.4	Equipment Specification	8
5.1.4.1	Bar Screen	8
5.1.4.2	Raw Effluent Pumps	8
5.1.4.3	Diffusers	8
5.1.4.4	Air blowers	8
5.1.4.5	Sludge Pumps	8
5.1.4.6	Chemical Cleaning pumps	9
5.1.4.7	Suction pumps	9
6.1	TEST/TRIAL RUNNING AND COMMISSIONING	9
6.1.1	Commissioning/Handing Over	9
6.1.2	Training of operator	9
7.1	GUARANTEE	
7.1.1	Manufacturer's Guarantees	10
7.1.2	Performance Guarantee	10
7.1.3	Mechanical guarantees	10
8.1	ANNUAL MAINTENANCE	11
9.1	LIST OF RECOMMENDED MAKES;	11

1.1 TECHNICAL SPECIFICATIONS (WWTP)

1.1.1 General specification - general requirements

The main source of effluent is wastewater resulting from bathrooms, pantries and washrooms. The scope of work includes detail design, drawings, coordinating during construction, erection, commissioning and obtaining best results for completely below sewage treatment plant with electrical, mechanical and piping. The treated effluent should be fit to reuse for irrigation.

1.1.2 Basic Data on Raw Waste Water (Sewage)

Total Suspended Solids (TSS)	:	300 mg/lit
BOD5 days	:	400 - 500 mg/lit
COD	:	600 mg/lt
pH	:	7.5 - 8.5
Peak Factor	:	2.5
Inflow Time	:	18 Hrs

1.1.3 Treated Waste Water Quality

As stipulated by State Pollution Control Board (PCB), the treated effluent quality shall be within the following values for various parameters, for both present and future.

pH	:	7.0 - 8.0
TSS	:	NIL
BOD 5 days	:	< 10 mg/lit
COD	:	< 30 mg/lt
Turbidity	:	<2 mg/lt
E coli	:	absent
Color	:	<05 hazen
Odor	:	unobjectionable

2.1 THE TREATMENT PLANT (STP)

Based on the Raw Waste Water characteristics the following treatment scheme is suggested:

- i. The Sewage is led into a Bar Screen Chamber provided with MS Bar Screen for removal of floating and large suspended matters.
- ii. The screened effluent is collected in an equalization tank. This sump is provided to dampen the flow fluctuations and, in order to keep the solids in suspension, pre-aeration is provided with coarse bubble tubular diffusers.

- iii. From equalization chamber sewage is allowed to Aeration tank, which comprises fine pore diffusers and Membranes immersed.
- iv. Using suction pumps connected to membrane units, water is sucked out from aeration tank.
- v. Sludge will be retained in the Aeration tank and excess sludge will be pumped/passed to sludge holding tank and then pumped to drain whenever MLSS measured is higher than designed.
- vi. Permeate of membrane is further treated with chlorinator and stored in final sump.
- vii. The waste sludge from aeration tank is passed to sludge holding tank and then pumped out to drain

Following are the units proposed for above treatment scheme;

- Bar screen chamber coarse (an ultrasonic non-contact type open channel flow measurement meter shall be installed before the bar screen)
- Oil and Grease separator
- Fine Screen
- Coarse bubble diffuser.
- Equalisation tank
- Pump Room
- Anoxic tank/ Aeration tank/MBR tank.
- Chemical cleaning of membranes
- Chlorinator
- Final tank
- Sludge holding tank
- Piping and cabling
- Units designed and proposed for LT panel

3.1 DESIGN CRITERIA

The STP is designed on the basis of wastewater flow and quality parameters. These values form the design criteria for design.

- i. Equalisation Tank (Balancing Tank)
Retention time : Min 5.0 - 6.0 hours based on peak hourly flow of raw sewage.
- ii. Aeration / Membrane Bio Reactor Tank
Influent BOD5 : 400 mg/lit
MLSS : 8000 - 12000 mg/lit

Oxygen requirement : 2.0 kgs per kg of BOD

iii. Membranes

Type : Hollow fiber / Sheet - Immersed type
Pore size : 0.4 micron
Casing material : ABS
Operating : Suction 2 way
Housing : Stainless Steel
Make : Torray Japan/Suez/Dupont

4.1 AUTOMATION OF SYSTEM

It is required to automate the system completely as specified below with;

- BMS based support Level transmitter at equalization tank connecting to PLC and controlling the equalization pump and permeate pump. (Link between inlet and outlet)
- Ultrasonic based Flow meter to monitor the flow to fine screen.
- Electrically actuated valve at fine screen entry to control flow to fine screen with link between level transmitter at screen and valve.
- Level transmitter at anoxic / aeration tank to control / monitor level and permeate pumps.
- TMP display and monitor /control between membrane out flow and permeate pumps.
- Flow meter at outlet of permeate pump with monitor/control permeate pump in comparison to raw sewage pump.

5.1 SCOPE OF CONTRACT & DESCRIPTION OF WORK

5.1.1 Scope of Contract

The tender is invited basis for design, Supply, Coordinating with construction works, Erection and Commissioning of Sewage Treatment Plant (STP) for MBR technology, to give treated effluent quality as specified.

The schematic drawings attached herewith are preliminary. However, the successful contractor will be required to submit the Detailed Process & Structural drawings (shop drawings) incorporating the thickness of various structural members.

These detailed drawings shall be submitted to Consultants for their comments & approval. Bidder has to submit all the technical details of equipment used for operation of plant to the consultant and should get approval. All the works shall be carried out as per final "valid for construction drawings" only.

Testing of all equipment at his workshop shall be certified from Consultant.

Inspection visit to certify all the equipment before supply shall be arranged for Consultant/PMC.

Complete interconnecting piping between various units as per piping details including supply of all materials like pipes, fittings, all valves, gaskets, flanges, nuts and bolts including all materials required for necessary pipe supports, etc.

Supply, erection and commissioning of all the equipment required for the sewage treatment plant as per the individual equipment specification.

All electrical works including all electrical motors for the various equipment confirming to IS 5600 - 1970, cabling, LT panel, starters, etc.

The scope of work includes coordinating all necessary civil works like construction of panel foundations, cable trenches, cable supports, lighting of entire plant as per drawing etc., complete.

Commissioning of all the equipment after the electricity is supplied will be within the scope of contract.

5.1.2 Details of civil works

Civil works (By civil contractor) carried out in the treatment plant which should be coordinated by STP bidder and bidder should furnish required levels and details. This include;

- i. Coarse Bar Screen Chamber
- ii. Fine screen
- iii. Equalization Tank
- iv. Anoxic/Aeration / MBR Tank
- v. Final tank
- vi. Working platform, staircase etc., as per drawing
- vii. Works such as pipe / cable trenches, chambers, equipment foundations, staircase headroom at entry of STP etc.,
- viii. Plant room.
- ix. Sludge holding tank.

5.1.3 General

The scope of STP bidder regarding Civil Works is coordinating necessary hydraulic testing for water tightness/seepage as per relevant BS codes for all water retaining structures and hydraulic levels of the units done by civil contractor.

Scope of contract for piping includes construction of necessary masonry valve chamber min 900mm x 900mm wherever necessary, removable type MS painted covers and extension spindles for valves.

Make of all piping/Equipment/Motors/Cables and Pumps shall be clearly stated in the offer and shall be approved by Consultant before Supply & Installation. The decision of Consultant in this regard shall be final and binding on the successful Contractor.

All equipment GA drawings shall be submitted to Consultant for approval prior to fabrication/ ordering. The fabricated and brought-out equipment shall be inspected at Contractor Works by Consultant and shall be dispatched to site only after obtaining clear dispatch instructions in writing from Consultant.

It is obligatory on the part of the intending bidder to visit the site of work prior to submitting the offer and familiarize himself with local/site /soil conditions, availability of men, Materials and Machinery for successful and timely execution of the works. No extra shall be paid in case Contractor fails to ascertain correct site conditions before submitting the offer.

All MS hand railing/ladders shall be given two coats of corrosive resistant paint over a coat of red-oxide primer or approved make and shade, which shall be scope of civil contractor.

Any other item not specifically mentioned in this tender but is essential for proper and successful completion, commissioning and running of the DSTP for its commercial utilization is also to be included in the scope of contract.

Fresh water line shall be provided to STP area but should be coordinated with plumbing bidder.

“STP bidder has to coordinate with Main contractor, plumbing bidder, Electrical contractor, Project management/Builder/Client, Architect and Consultant to establish the plant and to run the plant successfully”.

Battery Limits:

- Sewage Inlet up to STP screen chamber
- Treated water up to final sump in the STP
- Electrical feeder up to LT panel.
- Fresh water line up to STP.

5.1.4 Equipment Specification

5.1.4.1 Bar Screen

- Type -1 : Manually cleaned with Hand-rake.
 Construction : In SS flats of size 20 x 6 not more than 20mm c/c with necessary MS flat 25 x 6 stiffeners. The whole unit shall be given 2 coats of epoxy based paint over a coat of epoxy based primer. 1 no. MS hand rake shall also be provided with GI pipe rod.

5.1.4.2 Raw Effluent Pumps

- Quantity : Refer BOQ
 Duty : To transfer Raw Effluent from Equalization Tank to Aeration tank/MBR tank
 Type : Vertical submersible type pumps
 Motor : Built in vortex pump
 Material of Construction : Body and impeller in CI

5.1.4.3 Diffusers

- Quantity : Refer BOQ
 Fine-pore diffusers : Long Membranes of EPDM supported on PVC pipe secured at the ends by SS clams and construction with necessary accessories.
 Coarse bubble diffusers : Pressed PVC pipe with holes on the surface for air ejection with necessary accessories (for equalization tank and Final tank)

5.1.4.4 Air blowers

- Quantity : Refer BOQ
 Type : Twin lobe compressor

5.1.4.5 Sludge Pumps

- Quantity : ReferBOQ
 Duty : To transfer secondary sludge from clarifier to Aeration Tanks & sludge thickener.
 Type : Horizontal centrifugal non-clog Self-priming, open impeller, pumps
 Motor : TEFC Motor, with IP-55 protection and suitable for 400/440 V, 50 HZ A/c
 Material of Construction : Body and impeller in CI
 Accessories : Air cock with priming funnel, Flexible Coupling with guard, Base frame, foundation bolts etc.

5.1.4.6 Chemical Cleaning pumps

Back wash pumps.

Pumps are applied to clean the membrane surface from organic and inorganic loading. Preferred chemicals are NaOCl and citric acid.

5.1.4.7 Suction pumps

Suction shall be applied to the header on top of MBR modules and it shall be bank type. Pressure shall be as per design calculation. Details justifying the duty condition of pumps shall be submitted.

6.1 TEST/TRIAL RUNNING AND COMMISSIONING

The bidder shall have to test each equipment used for the plant for at least 72 hours continuous running with designed load and to the full satisfaction of Consultants. Any defects found, has to be rectified by the contractor at his own cost immediately and within reasonable time to be decided by client.

Necessary Instruments, Gauges, Labor/Supervisory Staff, Laboratory analysis etc., are to be furnished/provided by the bidder at free of cost to client. .

Bidder has to specify the value added services in his offer letter.

It is necessary for bidder to specify the minimum wastewater required for commissioning of STP.

6.1.1 Commissioning/Handing Over

During trial runs as described above, the bidder shall satisfy Consultant in all respects regarding the satisfactory quality of effluent, quality of materials, equipment and workmanship used in the plant.

Only after satisfying itself/ himself regarding the above points, client will take over the plant and such date of taking over shall be deemed as date of completion for all purposes, guarantees, and payment terms mentioned elsewhere in this tender.

The guarantee period described elsewhere in the tender should start from the date of completion.

6.1.2 Training of operator

Bidder shall provide necessary training for operator during commissioning period. Bidder to certify the operator performance to carry over the plant maintenance and operation efficiently after handing over the plant. Client / AM Contractor to provide 3 operators during commissioning stage for training purpose.

7.1 GUARANTEE

The under mentioned clauses shall govern in case of any contrary provisions given elsewhere in the document.

7.1.1 Manufacturer's Guarantees

The manufacturer's guarantee for design, workmanship, and performance for all bought out items shall be made available to the owner and shall be valid at least for the entire defects liability period.

In the event of failure of any particular equipment, which fails more than three items during the guarantee period as mentioned in clause below, the contractor shall replace at his own cost that equipment. Manufacturer's/ Contractor's guarantee, as mentioned in clause above, for such replaced equipment shall also be made available to the Owner and should be kept at least for one year from the date of last replacement.

7.1.2 Performance Guarantee

The Contractor shall give guarantee for a period of one year from the date of successful commissioning of the treatment plant against design, defective materials, workmanship, performance and guaranteed effluent quality. In the event the commissioning of the plant is not possible due to non-availability of effluent, contractor shall be issued mechanical completion certificate by Client/consultant provided each equipment is tested satisfactorily as directed by Consultant. However, the contractor shall have to maintain the plant at his own cost, in such a case for a period for three months beyond which period, if he is required to maintain further, he will be paid extra at mutually agreeable rate. However, the Contractor shall carry out testing and commissioning of the plant during the Defects Liability Period. Any defects found in the workmanship, the Contractor at his own expense shall make materials or performance of the plant good within the time specified by client/consultant.

7.1.3 Mechanical guarantees

The Contractor shall guarantee for a period of one year for the failure of any particular part of the equipment. In the event of failure of any particular part of the equipment more than three times during the guarantee period, the Contractor shall replace it. In case it is found that the above mentioned failure is due to some other connected part of the equipment, that part shall also be rectified or replaced by the contractor to avoid such failures in the future. The guarantee for such replaced parts shall be extended by one year from the date of last replacement.

8.1 ANNUAL MAINTENANCE

The contractor shall include in the offer for maintaining the treatment plant including all the consumables etc., qualified personnel shall be posted on the site on shift basis, to take the sampling and carry out the tests. A complete record has to be maintained for all the tests carried out at regular intervals.

The Contractor shall employ a minimum of one operator per shift and one supervisor during general shift based on 3 shifts/day. The senior chemist of the contracting firm shall visit at least once a week for monitoring plant operation.

Also one Senior Mechanical Technician shall visit the plant for inspection and supervision of maintenance of all equipment.

9.1 LIST OF RECOMMENDED MAKES;

1	Raw effluent pump	Grundfos / KSB / Wilo (sewage application)/ equivalent make as approved by consultant
2	Sludge pumps	Johnson / kirloskar / Wilo make as approved by consultant
3	Membrane	Torray/Dupont/Aquatech / Suez equivalent make as approved by consultant
4	Screw pumps	Alfa / hydro prakav / equivalent make as approved by consultant
6	Chlorinator	ASIA LMI / equivalent make as approved by consultant
9	Motors	Kirloskar / siemens / ABB / equivalent make as approved by consultant
10	Galvanized Pipes	Tata / Jindal / equivalent make as approved by consultant
11	GI fittings	R Brand (ISI) /Unik / equivalent make as approved by consultant
12	Gate valves/Non-return valves	Leader / Zoloto/ equivalent make as approved by consultant
13	Foot valves	Leader / Zoloto / equivalent make as approved by consultant
14	Butterfly valve	Inter valve / Slim Line / equivalent make as approved by consultant
15	ACB / MCCB / SFU / LBS	MERLIN GERIN / ABB / SIEMENS/ equivalent make as approved by consultant
16	CONTACTORS / OLR	TELE MECHANIQUE / ABB / SIEMENS/ equivalent make as approved by consultant
17	MCB / ELCB	MERLIN GERIN / MDS / INDO ASIA/ equivalent make as approved by consultant
18	MCB DB	MERLIN GERIN / MDS / INDO ASIA/ equivalent make as approved by consultant

19	DIGITAL METERS	AE / MECO / ENERCON / equivalent make as approved by consultant
20	Kwh / MDM / MDC METERS	AE / ENERCON / L&T/ equivalent make as approved by consultant
21	LED INDICATING LAMPS / PBS	TEKNIC / VAISHNO / SIEMENS/ equivalent make as approved by consultant
22	SELECTOR SWITCHES	KAYCEE / SALZER/ equivalent make as approved by consultant
23	LIGHT FIXTURES & MOTION DETECTORS	PHILIPS / WIPRO/ equivalent make as approved by consultant
24	SWITCHES / SOCKETS (MODULAR) OUTLETS IN METAL BOXES	ANCHOR ROMA / MDS MOSAIC / ABB/ equivalent make as approved by consultant

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
1.0	<u>Preliminary & Conditions of Contracts</u>				
1.1	Allow for mobilization and setting up stores, tools and all necessary equipment on site	Lot	1		
1.2	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	Lot	1		
1.3	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	Lot	1		
1.4	Allow for instruction to the client staff the operation and maintenance of the - waste water treatment plant system and initial maintenance during the six months defects liability period.	Lot	1		
1.5	Allow for liasing with main contractor, plumbing & electrical sub-contractor to in all areas that involves services to be connected to the - waste water treatment plant services.	lot	1		
1.6	Arrangement for all inspections and tests of the installation that may be required by the Engineer/Client and shall provide all instruments and equipment required for these tests	Lot	1		
1.7	Allow for co-ordination / liasing with main contractor, plumbing & electrical sub-contractor project manager, client, Architect and Consultants to establish the plant and to run the plant successfully	lot	1		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
<p>2.0</p> <p>2.1</p> <p>2.2</p> <p>2.2.1</p> <p>2.2.2</p>	<p><u>MEMBRANE BIO REACTOR BASED WASTE WATER TREATMENT PLANT INSTALLATIONS - (The above works to be carried out by a - waste water specialist)</u></p> <p><u>Waste Water Treatment Plant</u></p> <p>Supply and delivery to site a waste water treatment plant for - water treatment. The above works to be carried out by a specialist contractor, and should have a full back-up system in the country (Kenya) The plant should be able to treat water from 65m³ per day. Estimated water re-cycling rate is 5litres/second.</p> <p>The plant shall incorporate sludge, filtration pumps(duty/standby), bar screen coarse, oil and grease separator, fine screen, air blowers, suction pumps, chemical cleaning system, disinfection dosing system etc.</p> <p>Unit to be complete with interconnecting pipes / fittings/ valves and all the necessary controls.</p> <p>Automation of the system.</p> <p>The Packaged water treatment plant for - waste water treatment shall be complete with compatible Building Management System (BMS) running on BacNet protocol</p> <p>Level transmitter at equalization tank connecting to PLC and BMS controlling the equalization pump and permeate pump (link between the inlet and outlet of the plant)</p>	<p>No.</p> <p>No.</p>	<p>1</p> <p>1</p>		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.2.3	Magnetic flow meter to monitor the flow to fine screen	No.	1		
2.2.4	Level transmitter at anoxic / aeration tank to control / monitor the level and permeate pumps	No.	1		
2.2.5	Flow meter at outlet of permeate pump with monitor / control permeate pump in comparison to raw sewage pump.	No.	1		
2.3	<u>Pre-treatment:-</u>				
2.3.1	Bar Screen				
2.3.1.1	Manual bar screen of 5mm complete with an untra sonic non-contact type open channel flow measurement meter shall be installed before the bar screen	No.	1		
2.3.1.2	Internals for Oil and grease Tank	No.	1		
2.4	<u>Biological Treatment</u>				
2.4.1	Membrane System				
2.4.1.1	The water system should comprise of the following:- Flow transmitter, Manual fine screen, MBR Module immersed type with hollow fiber membranes	No	1		
2.4.2	Chlorine dosing system	No	1		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.4.3	Plant associated piping and fittings including all the valves, nipples, couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holderbats plugged and screwed	Item	1		
2.5	Diffusers				
2.5.1	Coarse bubble diffusers - Pressed PVC pipe with holes on the surface for air ejection with necessary accessories atc complete (for equalisation tank and final tank) Size - Equalisation tank, sludge holding tank - 90mmdia x 800mm long	No.	5		
2.5.2	Fine pore diffusers - Long membrane of EPDM supported on PVC pipe secured at the ends by SS clams and construction with necessary accessories etc. Size - 90mmdia x 1000mm long	No.	10		
2.6	Raw effluent pumpset				
2.6.1	Raw effluent pumpset. Duty 3 m ³ /h @ 12m head with level switch in sump size 600 x 600 x 600mm with perforated stainless steel grating. Power: 240V 50Hz. 1Ph. 1.0KW (grating & sump by MC). To trasfer raw effluent from the equalization tank to Aeration / MBR tank	Set	2		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.7	Control panel				
2.7.1	Integral control panel complete with mains isolator; pumps overload protection; power on, pump run and trip indicator lights, lights; ammeter; relays; pressure gauge; phase failure relay with over and under voltage protection, cyclic pump controller float switch for low water level cut-out, pressure switches easily adjustable for differential operating pressures and sequential operation.	No.	1		
2.8	Sludge Pumps				
2.8.1	Horizontal centrifugal non-clog self priming, open impeller pumps and complete with all the accessories ie. Air cock with priming funnel, flexible coupling with guard, base frame, foundation bolts etc. To transfer secondary sludge from sludge holding tank to drain	No	2		
2.9	Electrical wiring				
2.9.1	Associated electrical wiring from Control panels to the pumps motor terminals. (2 sets)	Item	1		
2.10	Air Blowers				
2.10.1	Air blowers - 100m ³ /h @ 0.5kg and to be complete with all the required accessories & connections - For equalisation tank, SHT, aeration tank. Should be having sound levels < 80 db	No.	2		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.11	Wiring				
2.11.1	Allow for all the electrical wiring to the raw effluent pumpset from local isolators Note: Electrical supply shall be brought to within two metres of equipment	Item	1		
2.12	Water tanks <u>Note:-</u> Each bidder should give the capacities that they require for the below water tanks to be RCC				
2.12.1	Collection / Equalization tank	No	1		By MC
2.12.2	Aeration tank	No	1		By MC
2.12.3	Final treated water tank	No	1		By MC
2.12.4	Sludge holding tank	No	1		By MC
2.13	Water tank accessories - Treated water tank				
2.13.1	Mechanical water level indicator installed in pump room for underground water tanks	No	1		
2.13.2	Mosquito proof ends of 100mm dia. Overflow of UG tank draining outside the pumproom	No	1		
2.14	Pressure gauge				
2.14.1	Pressure gauge to be fitted as instructed by the Engineer	No.	3		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.15	Air pipework:-				
2.15.1	Allow for air pipework installation GI/MSEP complete with all the couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holderbats plugged and screwed.	Item	1		
2.16	Inter-connecting pipework:-				
2.16.1	Allow for air pipework installation (uPVC or HDPE Pipes) complete with all the couplings, connectors, joints etc as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holderbats plugged and screwed.	Item	1		
2.17	Instruments:-				
2.17.1	Level Switches for the Tanks & Pressure gauges	Item	1		
2.19	Electrical Connections				
2.19.1	Allow for all the Electrical wiring , Cables , Cable trays as required to be a part of the supply and to be done by an Electrician	Set	1		
2.22	Guarantee & Maintenance				
2.22.1	Allow for 1 year guarantee & ½ year maintenance including spares but excluding fuel for the - waste water treatment plant system	Item	1		
Total carried to summary page BQ/8					

ITEM	DESCRIPTION	AMOUNT (KES)
1.0	Total for Preliminary & Conditions of Contracts B/F from BQ pg. 1	
2.0	Total brought forward from from BQ pg. 2	
3.0	Total brought forward from BQ pg. 3	
4.0	Total brought forward from BQ pg. 4	
5.0	Total brought forward from BQ pg. 5	
6.0	Total brought forward from BQ pg. 6	
7.0	Total brought forward from BQ pg. 7	
Total Carried to Form of Tender		

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HEAT VENTILATION AND AIR CONDITIONING (HVAC) TECHNICAL SPECIFICATIONS

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND
TRAINING (CPST)**

1.1	TECHNICAL SPECIFICATIONS (HVAC)	2
1.1.1	GENERAL SPECIFICATION - GENERAL REQUIREMENTS	2
1.1.1.1	Installations to Comply with This General Specification	2
1.1.1.2	Scope of the Installations	2
1.1.1.3	Statutory Obligations and Other Requirements	2
1.1.1.3.1	Technical Standards	2
1.1.1.3.2	Case of Conflict	2
1.1.1.4	Execution of Installations	2
1.1.1.4.1	The International System of Units (SI)	2
1.1.1.4.2	Programme of Installations	3
1.1.1.4.3	Builder's Work	3
1.1.1.4.4	Coordination of Installations	4
1.1.1.4.5	Cooperation with Other Contractors	5
1.1.1.4.6	Site Supervision	5
1.1.1.4.7	Sample Board	5
1.1.1.4.8	Material Inspection	6
1.1.1.4.9	Equipment Deviations	7
1.1.1.5	Drawings and Manuals	7
1.1.1.5.1	Drawings in Electronic Format	7
1.1.1.5.2	Installation Drawings	7
1.1.1.5.3	As-Built Drawings	11
1.1.1.5.4	Operation and Maintenance (O&M) Manual	12
1.1.1.5.5	Damaged Material	13
1.1.2	INSTALLATION METHODOLOGY	13
1.1.2.1	Installation Duct work	13
1.1.2.1.1	General Duct work	13
1.1.2.1.2	Duct dampers	16
1.1.2.1.3	Duct Access	16
1.1.2.1.4	Grilles and Diffusers (Supply and Extract)	17
1.1.2.1.5	External louvers	18
1.1.2.1.6	Painting & Identification	18
1.1.2.1.7	Pipe Work & Fittings	19
1.1.3	INSPECTION, TESTING AND COMMISSIONING	20
1.1.3.1	General	20
1.1.3.1.1	<i>Master Programmed of Testing and Commissioning Works</i>	21
1.1.3.1.2	<i>Inspection, Testing and Commissioning Methods and Procedures</i>	21
1.1.3.1.3	<i>Labor and Materials</i>	22
1.1.3.1.4	<i>Supply of Inspection, Measuring and Testing Equipment</i>	22
1.1.3.1.5	<i>Readiness for Commissioning and Testing</i>	22
1.1.3.1.6	<i>Documentation and Deliverables</i>	23
1.1.3.2	Testing and Commissioning - Definitions	24
1.1.3.3	Testing and Commissioning - General	24
1.1.3.4	Off-Site Tests	25
1.1.3.5	Site Tests	25
1.1.3.6	Inspection and Testing During Construction Period	25
1.1.3.6.1	<i>Periodic Site Tests</i>	25
1.1.3.6.2	<i>Test at Factory</i>	26
1.1.3.6.3	<i>Factory Test Certificates</i>	26
1.1.3.7	Documents and Data Required for Hand-Over	26
1.1.3.7.1	<i>General</i>	26
1.1.3.7.2	<i>Test Certificates</i>	26
1.1.3.7.3	<i>"As-built" Drawings</i>	27
1.1.3.7.4	<i>Operation and Maintenance Manuals</i>	27
1.1.3.7.5	<i>Manufacturer's Name Plate</i>	27
1.1.3.7.6	<i>Labels and Related Instructions</i>	27

1.1 TECHNICAL SPECIFICATIONS (HVAC)

1.1.1 GENERAL SPECIFICATION - GENERAL REQUIREMENTS

1.1.1.1 Installations to Comply with This General Specification

The HVAC Installations shall comply with this General Specification which details the intrinsic properties (including materials and workmanship) of the Installations in so far as it is not overridden by the Conditions, Particular Specification, Drawings and/or written instructions of the Engineer.

1.1.1.2 Scope of the Installations

This General Specification, Particular Specification, Tender Equipment Schedule and Drawings detail the performance requirements of the Installations. The Installations to be carried out in accordance with this General Specification shall include the design where specified, installation and supply of all materials necessary to form a complete installation including any necessary tests, adjustments, commissioning and maintenance as prescribed and all other incidental sundry components together with the necessary labor for installing such components, for the proper operation of the Installations.

1.1.1.3 Statutory Obligations and Other Requirements

1.1.1.3.1 Technical Standards

KEBS, BS, BS EN, ISO Standards, IEC Standards and Codes of Practice, etc. shall be deemed to include all amendments, revisions and standards superseding the standards listed herein, which are published before the date of first tender invitation for the Contract or the Nominated Sub-contract (as appropriate) unless otherwise specified.

1.1.1.3.2 Case of Conflict

The documents forming the Contract are to be taken as mutually explanatory of one another but in case of ambiguities or discrepancies the same shall be dealt with in accordance with the Conditions.

1.1.1.4 Execution of Installations

1.1.1.4.1 The International System of Units (SI)

The International System of Units (System International d'Unites) of weights and measures shall be used for all materials, equipment and measurements.

1.1.1.4.2 Programme of Installations

The HVAC Contractor shall submit to the Engineer a detailed programme of the Installations within 4 weeks from the acceptance of his tender showing the intended method, stages and order of work execution in coordination with the building construction programme, together with the duration he estimated for each and every stage of the Installations. The programme shall include at least the following: -

- (a) Dates for the placement of orders for equipment and materials;
- (b) Expected completion dates for builder's work requirements, i.e. when work site needs to be ready;
- (c) Delivery dates of equipment and materials to the Site;
- (d) Dates of commencement and completion of every stage of the Installations in line with the building construction programme, i.e. each floor level and/or zone area;
- (e) Dates of documents / drawings submissions to relevant Government departments to obtain the necessary approvals;
- (f) Dates of requirement of temporary facilities necessary for testing & commissioning;
- (g) Dates of completion, testing and commissioning; and
- (h) Short term programmes showing the detailed work schedules of coming weeks and months shall also be provided to the Engineer. Programmes shall be regularly updated to reflect the actual progress and to meet the HVAC Contractors' obligations under the Contract.

1.1.1.4.3 Builder's Work

All builder's work including openings or holes through building structure or partition walls; trenches, ducts and cutting; and all plinths, concrete bases, supports, ducts, etc. required for the Installations will be carried out as part of the building works by the Building Contractor at the expense of the Employer provided that the HVAC Contractor has submitted full details of such requirements within a reasonable time to the Engineer for approval, so that due consideration may be given before the Building Contractor commences the building works in accordance with the building programme in the areas concerned. After obtaining the said approval of the Engineer, the HVAC Contractor is required to mark out at the relevant locations of the Site the exact positions and sizes of all such works and to provide detailed information of such works to the Building

Contractor to facilitate him to carry out the builder's works as the works proceed.

All "cutting-away" and "making-good" as required to facilitate the HVAC Contractor's works will be carried out by the Building Contractor, except for minor provisions required for the fixing of screws, raw plugs, redhead bolts, etc. which shall be carried out by the HVAC Contractor. The HVAC Contractor shall mark out on Site and/or supply drawings of all "cutting-away" to the Building Contractor within a reasonable time.

All expenses properly incurred and losses suffered by the Employer as a result of the HVAC Contractor's failure to comply with the above requirements are recoverable by the Employer from the HVAC Contractor as a debt under the Contract or via the Building Contractor as if it is a debt liable to the Building Contractor under the Sub-contract as appropriate.

The HVAC Contractor shall ensure that such works are essential for the execution of the Installations. In the event that any of such works is proved to be nonessential, unnecessary and/or abortive, the HVAC Contractor shall bear the full cost of such works including but not limited to any unnecessary or incorrect cutting away and making-good and shall reimburse the Employer for all cost incurred in this connection are recoverable by the Employer from the HVAC Contractor as a debt under the Contract or via the Building Contractor as if it is a debt liable to the Building Contractor under the Sub-contract as appropriate.

1.1.1.4.4 Coordination of Installations

The HVAC Contractor shall coordinate the Installations with those works of the Building Contractor and any other contractors and sub-contractors of the Building Contractor. The HVAC Contractor shall note that the drawings supplied to him only indicate the approximate locations of the Installations. He shall make any modification reasonably required of his programme, work sequence and physical deployment of his work to suit the outcome of work coordination or as necessary and ensure that all cleaning, adjustment, test and control points are readily accessible while keeping the number of loops, cross-overs and the like to a minimum.

No work shall be carried out before approval of shop drawings or equipment has been given by the Engineer. It is the HVAC Contractor's responsibility to co-ordinate all Mechanical works to match with the structure of the building and the proposed arch and interior design of the building including but limited to ducts, grilles, equipment, pipes, light fittings, false ceiling layout and other services to allow a completely symmetrical and coordinated installation. HVAC Contractor shall prepare section as required to demonstrate all constraints and coordinate the same

for resolving any conflicts among the services. Contractor shall ensure that all required access, clearances and false ceiling heights are achieved as per the requirements are achieved.

1.1.1.4.5 Cooperation with Other Contractors

The HVAC Contractor shall cooperate at all times with the Building Contractor and all other contractors and sub-contractors of the Building Contractor in order to achieve efficient workflow on the Site.

Any significant problems beyond the HVAC Contractor's control shall promptly be reported to the Engineer.

Access doors shall be provided by the Contractor as required to provide proper access to all ducts, dampers, fans and all other concealed items which are located above ceilings or in walls and in partitions, whether such accesses are shown in the drawings or not. The omission shall be brought to the attention of the Engineer before installation of equipment. All access doors shall be properly designed, sized and located to suit the service required or as directed by the Engineer and to his satisfaction.

1.1.1.4.6 Site Supervision

The HVAC Contractor shall keep on the Site a competent and technically qualified site supervisor to control, supervise and manage all his works on Site. The site supervisor shall be vested with suitable powers to receive instructions from the Engineer.

All tradesmen must be experienced in the trade and the work carried out shall be consistent with good practice in Kenya and to the satisfaction of the Engineer. In this connection, the HVAC Contractor's attention is drawn to the Special

1.1.1.4.7 Sample Board

The materials offered for approval shall be strictly in accordance with the specifications and tender drawings. The contractor shall submit in triplicate, the technical literature for each item of the equipment, he intends to use for the project, to the consultant for the necessary review and approval. If in case the technical literature is not available, then a sample shall be submitted in the absence of either of these, typed technical data shall be submitted duly supported by telex / letter of the manufacturer for confirmation. In case of items involving fans, dampers etc., and samples must be submitted for approval along with the materials submittals. Each copy of the submittals shall be numbered and signed with the technical literature clearly highlighted, indicating the model, type and capacity of

the equipment offered. The consultant shall retain two for copies and return one, either Approved or Not Approved, to the contractor. The contractor shall maintain and submit a status report every month, of all the Materials submittals of the Plumbing Materials & Equipments in the following proforma to the consultant:

- i. Submittal Number
- ii. Type of Material
- iii. Manufacturer / Local Agent
- iv. Date of Approval
- v. Date of Order / Order Number
- vi. Mode of Delivery (Air, Land or Sea)
- vii. ETA on Site
- viii. Status as on date of Report

Within 4 weeks of the acceptance of his Tender and prior to the commencement of the Installations, the HVAC Contractor shall submit to the Engineer for approval a sample board of essential components proposed to be used in the Contract. However, the HVAC Contractor may request the Engineer in writing for a longer period for submission if 6 weeks are practically insufficient.

Items displayed shall be deemed to be adequate for the Installations unless otherwise clearly indicated. Each sample, with clear numbering and labeling, shall be firmly fixed onto a rigid wooden or metal board. A list shall also be affixed on the sample board to show the item description, make and brand, country of origin and locations of installation (if not generally used). Samples rejected by the Engineer shall be replaced as soon as possible. Upon approval of all items, the Engineer will endorse the list on the sample board and the HVAC Contractor shall deliver the board to the site office for reference.

The following items shall be included in the sample board as a minimum:

- i. Duct work, fittings and their support complete with fixing accessories;
- ii. Disk Valves
- iii. Grilles; and
- iv. Vibration isolator

Additional items may be required by the Engineer and/or specified in the Particular Specification

1.1.1.4.8 Material Inspection

The contractor shall inform the consultant within one week upon receipt of all the materials at the site and arrange for the inspection of the same. Any material used at site which is not approved earlier specifically shall stand rejected without notice. Any item on supply differs from the one shown on the submittal catalogue copy or the sample submitted shall also be rejected at site. In such cases, the contractor shall make a fresh submittal for the item and obtain approval from the Consultant. Any time delay caused due to the above shall be on the Contractor's account. The contractor shall have to remove the rejected materials from the site and replace with approved materials at his own expenses. In the event the contractor fails to do so, the client shall have the liberty to carry out such works from other agencies and debit the ensuing amount to the Contractor.

1.1.1.4.9 Equipment Deviations

Subsequent to the award of the Contract, and only in exceptional circumstances where it is demonstrated in writing by the HVAC Contractor that the original equipment offered cannot be obtained, the Engineer may consider and accept, in writing, alternative equipment and materials proposed by the HVAC Contractor provided always that these are fully in compliance with the relevant Specifications and Drawings and do not impose any additional contractual or financial liabilities onto the Employer.

In the event that the approved alternative equipment or material is lower in price than the original offered equipment or material, the net difference in price between the original offered equipment or material and the approved alternative equipment or material with the executed quantities of the relevant work item shall be deducted from the Contract Sum in accordance with the Contract. The Contract Sum, however, shall not be adjusted where the approved alternative equipment or material is higher in price than the original offered equipment or material.

1.1.1.5 Drawings and Manuals

1.1.1.5.1 Drawings in Electronic Format

The HVAC Contractor shall provide drawings in electronic format as required in the following clauses. These drawings shall conform to the latest version of CAD Standard.

1.1.1.5.2 Installation Drawings

1.1.1.5.2.1 Drawing Submission Schedule

The Plumbing tender drawings related to this project have been listed in the Schedule of Drawings enclosed with the specifications. The tender drawings have been prepared to show the tenderer the principal equipment and general arrangement required for the project. These drawings do not indicate every detail of the work. It is the Contractor's responsibility to check the positions / locations at site. All dimensions are tentative and shall be checked with the Architectural and Structural drawings. Any discrepancy shall be brought to the attention of the consultant, in writing at the time of tender. Particular attention shall be paid to the positioning of disc valves, duct work, and other accessories, in relation to the Interior finishes and locations of various appliances. The Contractor is deemed to have studied the services drawings based on all the local regulations and have included in his prices for all builders' work associated with these drawings.

The HVAC Contractor shall submit a detailed installation drawing submission schedule and programme to the Engineer. The HVAC Contractor shall allow reasonable time in the programme for vetting of the installation drawings by the Engineer and for drawing resubmissions as necessary.

The HVAC Contractor shall provide at least 6 hard copies and one electronic copy, unless otherwise specified in the Contract or the Sub-contract as appropriate, of the approved installation drawings to the Engineer for distribution.

Unless otherwise indicated or instructed, the HVAC Contractor shall, in the stated or in adequate time before each section of the work proceeds, prepare, and submit for acceptance by the Engineer, detailed installation drawings and/or shop drawings (which may also be referred to as working drawings) to demonstrate how they propose to install the works both in 'Detail' and 'Form' to facilitate the practical installation. These drawings shall be fully dimensioned and shall be based on the basic intentions of the Drawings but shall not be simply a copy of them.

1.1.1.5.2.2 Size of Installation Drawings

Drawings submitted by the HVAC Contractor shall only be of standard sizes from A0 to A4 or B1 size as stipulated in ISO 5457:1999.

HVAC Contractor's 'Installation Drawings' and/or 'Shop Drawings' shall be prepared to such scales that will clearly show all necessary details.

The drawings shall be prepared to the same sheet sizes and scales as used for the ultimate 'As-Installed' record drawings.

1.1.1.5.2.3 Contents of Installation Drawings

In accordance with the provisions of this General Specification and as stated elsewhere in the Contract, the installation drawings must incorporate details of the actual plant and equipment items as approved by the Engineer.

The HVAC Contractor shall ensure all installation drawings are accurate representation of the Installations, before submitting them to the Engineer. All installation drawings shall be fully dimensioned and suitably scaled showing construction, sizes, weights, arrangements, operating clearances and performance characteristics.

a) "Installation drawings" shall generally include, but not limited to, the following: -

Symbols and notations same as and compatible with the Drawings' standard;

Complete layout/assemblies including all necessary minor items and accessories;

Positions of all fixings, hangers and supports;

Maintenance spaces for all withdrawable items, such as coils, heater elements, thermometers, thermostats, fan shafts and fan blowers, cleaning and replacement of tubes, removal of guards, etc.;

b) Ductwork Installation Drawings

Prior to the commencement of any manufacture, fabrication, or installation, the HVAC Contractor shall submit to the Engineer for technical appraisal installation drawings for the ductwork installation. Generally, the drawings shall be drawn to a scale of not less than 1:50. Subject to the Engineer's approval a scale of 1:100 may be adopted where the installation is a simple one.

The locations of fans, disc valves, flexible ducts and their routes, etc., as indicated on the tender drawings is tentative and may require some variation to suit the site requirements. The exact positions must be checked and shown on the detailed working drawings as indicated on the detailed architectural drawings and coordinated with furnishing and other services.

The drawings shall indicate the location, with dimensions given, of all ductwork in relation to the building structure and other pipework and equipment. The position of all disc valves, fans, dampers, etc. shall be shown together with clearances necessary for their removal.

Positions and details of all hangers and supports shall be shown and the positions dimensioned.

Positions of thermostats, thermometers, test pockets and similar devices shall be shown and dimensioned including clearances required for their removal.

Details and outline of insulation and insulation boxes shall be shown including clearances required for removal of the boxes.

c) Special Plant Rooms Co-ordination Work

Unless otherwise stated in the Contract, in the case of a plant room where the HVAC Contractor's equipment constitutes the major item involved (i.e. as in the case of pump room), the HVAC Contractor shall allow in the Tender for taking effective responsibility for the coordination of other services/building details within these specific areas.

1.1.1.5.2.4 Manufacturer's Shop Drawings

The manufacturer's shop drawings are drawings for equipment or plant to be manufactured by a specialist manufacturing supplier in their own workshops and places away from the Site.

The drawings shall show detailed construction, principal dimensions, weights and clearances for maintenance, etc. Immediately after placing of any order or at any event within 4 weeks unless otherwise approved in writing by the Engineer, the HVAC Contractor shall forward to the Engineer for comment, 4 copies of manufacturer's shop drawings indicating detailed construction, principal dimensions and weights, clearances for withdrawals and/or cleaning, etc. No work shall proceed on or off Site unless drawings requiring approval are so approved in writing by the Engineer

1.1.1.5.2.5 Checking Drawings of Other Trades

The HVAC Contractor shall follow the design intent of the Drawings in planning and carrying out the work and shall cross check with other trades in order to verify the line, level, space and sequence in which the Installations is to be installed.

If directed by the Engineer, the HVAC Contractor shall, without extra charge, make reasonable adjustments to the proposed installation drawing layouts as are necessary to prevent conflicts with the work of other trades or for the proper sequence of and execution of Works. Where such modifications are of a nature and of such unforeseen complexity that they

involve unreasonably extra work not covered by the Contract, they may be covered by variation order to be issued by the Engineer wherever such a requirement is justified.

1.1.1.5.3 **As-Built Drawings**

1.1.1.5.3.1 *Submission of As-built Drawings*

The HVAC Contractor shall submit 3 sets of the first draft prints of as-built drawings within 28 days of the issuance of the certification of completion in accordance with the Contract to the Engineer for checking. The Engineer after checking the above draft prints shall return one set of the marked up copies of these as-built drawings to the HVAC Contractor within 42 days from the date of submission of the HVAC Contractor's draft prints with comments. The HVAC Contractor shall within a further 28 days from the date of receiving the Engineer's comments on the draft as-built drawings re-submit to the Engineer for his approval another 3 sets of the second draft prints of as-built drawings with the Engineer's comments incorporated. This process of submission and approval shall continue until the final approval of the Engineer on these as-built drawing is obtained.

The final approved as-built drawings shall be in 3 sets of hard copy and 3 sets of electronic copies. These shall be submitted within 21 days from the date of final approval. Each electronic copy shall be in the form of CD-ROM, labelled, with cross reference to a printed list of files explaining the contents and purpose of each file and supplied in sturdy plastic containers.

The detailed requirements and the media of as-built drawings set out in the Contract shall be followed as appropriate.

1.1.1.5.3.2 *Size of As-built Drawings*

As-built drawings shall only be of standard sizes of A0, A1 or B1 size as stipulated in ISO 5457:1999. Smaller size (A2 to A4) is accepted for installation drawings.

1.1.1.5.3.3 *Content of As-built Drawings*

The HVAC Contractor shall ensure all as-built drawings are accurate representation of the Installations, before submitting them to the Engineer. The as-built drawings required to be provided by the HVAC Contractor for various types of the Installations shall include, but not limited to the following: -

- (a) Plumbing and drainage layout plans such as pipe arrangement, valve arrangement, sanitary fitments arrangement, etc.;
- (b) System schematic diagrams; and
- (c) Installation details and assembly drawings such as pipework, sanitary fitments, etc. "As-built" drawings shall complete with all details to be used for commissioning purposes. Any amendments noted on these drawings during the commissioning and test stage shall subsequently be transferred to the original "As-built" drawings once the amendments have been accepted by the Engineer

1.1.1.5.4 **Operation and Maintenance (O&M) Manual**

The HVAC Contractor shall refer to the Specifications for any other requirements in O&M Manual.

The O&M Manual is for use by the maintenance agent of the completed Installations. It shall contain detailed technical information covering both operation and maintenance aspects of the Installations.

Operating and maintenance manuals shall contain the following:

- a) A description of the buildings to which services are applied stating their duty and functions,
- b) A listing and description of the services as installed,
- c) Details of the manufacturer's installation, operating and maintenance requirements which must be edited or otherwise reproduced to be specific for the installation.
- d) A detailed list of equipment supplied, manufacturer, address, telephone number and official order number/date,
- e) A schedule detailing the regular maintenance requirements with space for remarks and service history,
- f) A fault tree analysis of the system(s),
- g) A copy of the "As fitted" record drawings,
- h) Copies of all test and commissioning data including pre-commissioning check lists,

- i) A schedule giving the finally adjusted set points for plant, equipment and controls,
- j) A detailed listing of all spare parts giving part number and description, typical cost and availability,
- k) Any item deemed necessary by the Engineer to clearly identify to the use/operator the function and intended performance of the plant and system.

1.1.1.5.5 Damaged Material

Any plant or material that is damaged by any means whatsoever shall not be used in the works. Should the contractor wish to rectify such damage in order to utilize the plant or materials in the permanent works, the matter shall be brought to the attention of the Consultant, who in turn shall conduct a proper survey after which the necessary instructions shall be issued. Only after obtaining a written permission from the Consultant, shall any remedial work be carried out. Any damaged Plant or Material allegedly brought to a "as-new" condition following such a procedure, shall only be accepted after the technical appraisal & discretion of the Consultant, whose decision in such matters shall be final and binding.

1.1.2 INSTALLATION METHODOLOGY

1.1.2.1 Installation Duct work

1.1.2.1.1 General Duct work

A complete range of supply and extract ducting, including plant connections shall be supplied.

The galvanized ductwork shall be complete with dampers, bends, branch connections, tapers, transformations, inspection openings and any special pieces necessary to complete the system. All positions of ducting and plant shall be checked on site and detailed working drawings shall be submitted to Engineer for approval before manufacture is commenced.

All bends and take-offs shall be designed to keep resistance to air flow to a minimum, and where fittings having a mean radius ratio of less than 1:1 are unavoidable, internal guide vanes of approved design shall be provided. Transformation or taper pieces shall, where possible, be

constructed so that the angle for any one side does not exceed 15° to the axis of a duct.

Rectangular bends and take-offs are not permitted. Multi-leaf volume, control and isolating dampers shall be supplied and fixed wherever necessary and shall be complete with lockable operating lever quadrant and open/shut indicator plate. After final regulation and balancing the position of the damper lever shall be marked on the damper quadrant in the red paint and locked in position.

Except where fire dampers are built into the structure, ductwork passing through floors, walls, etc. shall be provided with 1.20 mm thick galvanized steel sleeves flanged to the building structure, the annular fully packed and tightly compressed with slag wool 1000°C grade, to provide a fire stop and to eliminate movement of air between the duct and the sleeve and transmission of noise from one area to another. Duct shall not come into direct contact with the fabric of the building and shall maintain adequate clearance with other services to permit full insulation and vapor sealing.

All nuts and bolts shall be sherardized. The fastening of electrical cables (other than equipotential bonding) and other equipment to ductwork will not be permitted.

Test holes shall be provided in the ducting system at all main and branch ducts and wherever necessary to ensure satisfactory commissioning of the system and these holes shall be provided with suitable permanent covers. Rubber plugs or taped sealers will not be accepted. Holes required for thermometer bulbs and thermostats, etc. shall also be provided complete with sliding union collar fixture.

All joints and connections throughout the ducting systems shall be airtight to the requirements of HVCA/DW142. Branch connections shall be supplied with gaskets and all joints shall be packed with suitable fire resistant sealing compound of approved make.

Flexible duct joints shall be provided at inlet and outlet of each fan and packaged unit. The joint material shall be flame retardant.

All the supply and extract galvanized ductwork shall be designed for low velocity and except where specified otherwise, shall be constructed and stiffened to standards contained in the Heating and Ventilating Contractors Association (Ductwork Group) Specification DW/142 and the Practical Guide DW/143.

Each and every section of ductwork shall be provided with an earth bonding and equipotential brass stud or studs and cable fixing to suit the earthing systems.

All ductwork shall be adequately stiffened where necessary by external angle iron or cross-bracing and large ducts internally by bracing arranged to present minimum resistance to air flow. Internal bracing to ducts shall be of similar material to the ducting.

Approved slip joints may be used but sufficient flange joints shall be provided to facilitate the stage by stage erection and where sections of ductwork have to be installed in advance to accommodate the building programme. Engineer shall reserve the right to decide where flange joints are required. All joints shall be sealed in an approved manner. Access doors to the ductwork shall be fitted where necessary for cleaning and where called for in the Specification. They shall be of the wing nut bolted-on type except where hinge types are indicated.

Access doors and door openings in the ductwork shall be adequately stiffened and made airtight with a neoprene gasket. Access doors installed to systems required to be insulated shall be of the double skin pre-insulated type, thickness of insulation to match with the adjacent duct insulation.

Duct connections to builders work duct and openings shall be provided with suitable angle frames to stiffen the ducts and ensure that the connections remain airtight. Bends and off-sets shall have a throat radius equal to the width of the duct. Where short radiused elbows are indicated or are agreed by Engineer as necessary due to site limitations, the dimensions and internal vanes shall be in accordance with HVCA (Ductwork Group) specification DW/142, 1982.

Supports shall comply generally with HVCA specification DW/142. Where cantilever brackets or other special forms of support are indicated they shall be structurally strong enough to take the load and to transfer the load to the building structure without distortion. The final position of the ductwork and the proposed method and material for supports must be shown on the working drawings submitted for approval and coordinated with all other services in conjunction with the Main Contractor before submission to Engineer.

Any part of galvanized ductwork where the galvanizing is damaged during manufacture or erection shall be painted with two coats of

aluminum, zinc rich corrosion resisting paint to the satisfaction of the Engineer.

Sizes of ducting indicated upon the drawings shall be the airway internal dimension.

Grilles shall be provided with boot neck sections to keep the grille clear of the duct air stream in all cases.

1.1.2.1.2 Duct dampers

Volume control, isolating and balancing dampers shall be provided where required for balancing and regulation purposes and as deemed necessary. Dampers shall be opposed-blade multi-leaf type with double skin aerofoil section blades constructed in galvanized sheet steel, or aluminum and securely fixed to a central spindle. The blades shall be stiffened to prevent flutter. Spindles shall be carried in non-ferrous nylon or bronze bearings. Quadrants shall be made out of metal casting. All dampers shall incorporate neoprene rubber blade edges and leakage pass the dampers when fully closed shall be minimal. Damper frames shall be constructed from 16 mm gauge thick galvanized channel. Multi-leaf dampers shall be used in rectangular ducts having a short side in excess of 300 mm. No damper blade shall exceed 1200 mm width and where dampers are required for the greater width the damper sections shall be constructed in multiple frames. Individual damper blades shall not exceed 175 mm in height. Multi-leaf dampers shall operate on the opposed blade principle and provision shall be made for linkages to connect the multiple extended spindles and a suitable indicating device shall be provided on the outside of the damper section

1.1.2.1.3 Duct Access

Access openings shall be provided in the ductwork for purposes of cleaning and inspection and shall be positioned to the approval to the Engineer. Unless otherwise approved each access point shall have a minimum clear opening of 450 mm x 450 mm or equivalent area to suite the duct section.

Openings shall have rubber edge lip seals and be fitted with covers having turned down edges, and be secured with bolts and wing nuts into tapped holes unless hinged covers are to be provided. Covers and openings shall be adequately stiffened and shall be airtight. Inspection openings with cover plates shall be provided each side of all fit treatment devices, exchangers, adjacent to all dampers and all items of plant requiring periodic inspection, cleaning and for maintenance purposes. No

inspection opening shall be more than 10 meters apart. Where ducts are to be thermally insulated, it is a requirement that the access door frame be extended beyond the face of the duct by a measurement at least equal to the thickness of the insulation and be so arranged that the insulation and finish can be dressed into the frame thereby ensuring that the opening is not concealed and that the edges of the insulation are protected from accidental damage. The access door should be double skinned and filled with insulation of the same thickness as the duct insulation.

1.1.2.1.4 Grilles and Diffusers (Supply and Extract)

Grilles and diffusers shall be designed to prevent draughts, air noise and staining of walls and ceilings. All duct mounted air supply diffusers shall be complete with an opposed blade volume control damper and designed to give the desired air pattern. The general air flow pattern shall be fixed by the air diffuser but means shall be provided to adjust the final air flow pattern and direction of throw. Extract grilles shall be mounted direct to the ducting and shall be of the fixed blade type with blades set at an angle of approximately 45° complete with a opposed blade damper behind the grille. Transfer grilles shall be of the non-vision type designed to pass the required air volume with a minimum of resistance. Transfer grilles shall be provided with two matching flanges and gaskets, one for each side of the door/wall structure. Where transfer grilles are fitted into fire doors they shall be complete with a purpose designed fire damper to match the door thickness and give the desired fire rating.

The Contractor shall supply and install, in the locations shown on the drawings, supply and return linear diffusers. The slot diffusers shall be suitable for horizontal discharge by the adjustment of the blades. Seal all outlets around the edges to prevent air leakage with proper gasket or sealant subject to Engineer approval.

Diffuse supply air velocities shall not excess of 0.25 m/s at 1.8 m floor level. Diffusers shall be of diffusion and air mixing type. Diffusion shall be effected without objectionable air motion at a point within 1.8m above the floor line.

Unless otherwise stated all grilles and diffusers shall be constructed of aluminum with a standard satin aluminum finish. They shall be fixed into wood frames with cadmium plated wood screws to match or by other proprietary securing devices. As alternative, extruded aluminum with powder coated painting for the grills/diffusers may be considered. The air velocity through the supply air grilles and diffusers shall be the minimum to provide the necessary duty at the throw and with the minimum noise level which must be at least 5 dB below the room design noise level. Grills

and diffusers shall not be positioned above the switchgears or control/relay panels.

1.1.2.1.5 External louvers

All fresh air inlet and exhaust louvers shall be designed to prevent rain and excess deposit entry at the operating velocities of the fresh air inlet louvers. All construction joints shall be fully weather sealed. Unless otherwise indicated all louvers in the external walls of the building required for exhaust or fresh air inlets to the systems shall be of mild construction heavily galvanized after manufacture and finally degreased, etched, printed and painted two coats of paint to approved colour. The blades shall be formed from not less than 1.63 mm thick sheet plate carried in a robust galvanized mild steel channel frame suitable for fixing direct to the building structure. The bottom channel of the frame shall be drilled at each end to receive a small bore copper weep pipe. The maximum length of louver blade shall not exceed 1.0 meter without intermediate bracing supports. Bird and vermin proof wire guards shall be fitted behind each louver. The louvers shall be designed for a maximum free area and designed to pass the required air volume with a minimum pressure drop. Sand louvers shall be manufactured in galvanized steel enclosed within a galvanized flanged holding frame. Louvers shall be complete with insect screen and sand collection gravity chamber. Sand louvers shall have an efficiency of 97 percent when tested particles between 150 to 450 microns. Face velocities shall not exceed 1.5 m/s. Wherever possible louver sub-frames shall be vertically hinged to permit ease of cleaning

1.1.2.1.6 Painting & Identification

All external ductwork supports shall be etch primed and painted with two coats of approved primer, and finished with two coats of chlorinated rubber based paint on all external faces.

A protective finish shall be applied to all mild steel internal ductwork sections (flanges, stiffeners, hangers, supports, etc.) before fixing, consisting of two coats of red oxide or zinc chromate paint.

All rotating plant shall be complete with 150 mm long arrows indicating the correct direction of rotation.

Arrows shall be situated in a position where they can easily be seen and not on the "blind" side of plant. This requirement shall also apply to plant identification labels and plates.

Letters and identification symbols shall be pro-colored plastic, adhesive backed and purpose-made for the application.

Ductwork shall be identified with black or yellow PVC symbols in accordance with HVCA Code of Practice DW/142.

Ductwork within plant room's areas shall be identified at 6 meter intervals and at all "T" junctions, mixing zones and terminations.

Ductwork external to plant rooms shall be identified as above but at maximum intervals of 15 meters, at all access points and where deemed necessary by the Engineer.

1.1.2.1.7 Pipe Work & Fittings

Each part of the piping system shall be complete in all details and provided with all central valves and accessories necessary for satisfactory operation.

The tender drawing indicates generally the size of all piping. While the sizes are not to be decreased, the contractor will check and change the runs and sizing of piping to accommodate conditions during construction subject to engineer approval.

All piping shall be grouped wherever practical and shall be erected to present a neat appearance. Pipes shall be parallel to each other and parallel or at right angles to structural members of the building and shall give maximum possible headroom.

All pipe drops shall be truly vertical. No joints shall be formed in thickness of walls, floor or ceilings.

Pipes shall generally be set around columns and shall follow the contour of the building whether so indicated on the drawings or not. Piping shall not pass in front of doorways or windows and shall be generally arranged so that it is at least 200 cm above finished floor level and at least 2.5 cm from finished wall face. Sufficient space is to be allowed for accessibility for servicing. Piping shall be perched for proper circulation and drainage.

Run outs shall be graded in such a manner to prevent air traps and to allow natural venting of horizontal piping to be installed with a Minimum slope of 0.2% upward pitch towards the vertical riser. U-shape routing of pipe work shall be avoided. Automatic vents are to be provided at high points, with isolating valves.

All drain piping shall pitch down in direction of flow. All low points of the system must be fitted with drain valves to permit the complete draining of the system. Bottoms of all risers must have dirt pockets of the size of riser

at least 30 cm long with a drain valve fitted. All water piping to equipment shall be connected with either flanges or unions for dismantling and removal. All piping shall be seamed after cutting to remove all burns.

All reduction in sizes of piping in the direction of down ward pitch shall be installed with eccentric fittings to maintain bottom level.

Approved pipe fittings shall be used and bending of pipes will not be normally allowed. Piping shall not be installed passing through ductwork or directly under electric light outlets or extend beyond furring lines determined by the plans.

In placing pipes through sleeves, near wall, partitions or in chases, care must be taken to provide sufficient space for pipe covering or insulation.

1.1.3 INSPECTION, TESTING AND COMMISSIONING

1.1.3.1 General

Throughout the execution of the installation, the HVAC Contractor shall be responsible for ensuring compliance with the Regulations included in Part A and shall notify the Engineer of any infringement which directly or indirectly detracts from the safe and satisfactory operation of the installation(s) whether or not such infringement relates to the works covered in the Contract or to those associated with others

The HVAC Contractor is required to appoint a competent and experienced testing and commissioning engineer responsible for the overall planning, organizing, coordinating, supervising and monitoring of the testing and commissioning works and also certifying all results and reports from the testing and commissioning works. The PD Contractor shall submit, at the commencement of the Contract, information detailing qualification and experience of the testing and commissioning engineer for the Engineer's approval.

It is necessary to require the HVAC Contractor to provide, at no cost to the Employer, all necessary equipment, apparatus, tools and materials for carrying out of testing and commissioning works.

Before commencement of any tests, the Contractor shall obtain and schedule a list of commissioning information requirements which shall include the following:

- i. full pre-commissioning check lists for all plant and equipment,
- ii. all fan speeds and duties,
- iii. all design air flow rates and pressures within ductwork systems,
- iv. all supply and extract air design volumes,
- v. all room temperature, humidity and air pressure requirements,
- vi. sound levels in selected areas,
- vii. design static pressure losses across dampers, air filters and silencers, etc.,
- viii. power demands, starting currents, running currents and control logics,
- ix. manufacturer's setting to work and operating instructions,
- x. all other details necessary to identify the performance of the plant and equipment installed

The HVAC equipment shall not be started until preliminary checks have been made on the correct rotation and installation of all plant, and control system(s) have been correctly wired and are fully operational.

Where deemed necessary by the Engineer, plant and equipment shall be tested in sections to suit the building construction rate.

1.1.3.1.1 *Master Programmed of Testing and Commissioning Works*

The HVAC Contractor is required to submit a programme for testing and commissioning works shall be submitted at the commencement of the Contract, usually within the first three months. The programme shall indicate the tentative dates of all tests and commissioning works that will be carried out throughout the whole contract and all necessary submissions and approval relating to testing and commissioning and ensure that the testing and commissioning programme matches the master programme for construction and that all testing and commissioning works are complete before the completion date of the Contract.

1.1.3.1.2 *Inspection, Testing and Commissioning Methods and Procedures*

The HVAC Contractor is required to submit detailed inspection, testing and commissioning methods and procedures together with report formats for reporting inspection, testing and commissioning results for the Engineer's approval at least four months before commencement of testing and commissioning works, or four months after the commencement of the Contract, whichever is earlier

1.1.3.1.3 *Labor and Materials*

The HVAC Contractor is required to be responsible for provision of all labour and both consumable and non-consumable materials for carrying out testing and commissioning works at their expenses. Electricity supply, water and LP gas and town gas for carrying out of testing and commissioning works shall also be arranged and provided by the PD Contractor at no cost to the Employer

1.1.3.1.4 *Supply of Inspection, Measuring and Testing Equipment*

The HVAC Contractor is required to supply the calibrated equipment and instrument for testing and commissioning works in accordance with the requirements as specified in the Particular Specification.

1.1.3.1.5 *Readiness for Commissioning and Testing*

The HVAC Contractor is required to check the completion of the works to be tested or commissioned, the associated builder's works and the associated building services installations to ensure that testing and commissioning can be proceeded in a safe and satisfactory manner without obstruction.

"Type-test" for equipment shall be carried out at the manufacturers' works or elsewhere appropriate in order to demonstrate their compliance with the Regulation or requirements. "Type-test" certificates together with the corresponding drawings, sketches, reports and any other necessary documents shall be submitted to the Engineer for approval before delivery of the equipment.

Prior to the testing and commissioning works, the HVAC Contractor shall check the completion of the installation works, associated builder's work and related building services installations, to ensure that commissioning can be proceeded without obstruction. Before any installation is subjected to commissioning and site testing, it shall be thoroughly cleaned both

internally and externally. All pipes shall be thoroughly cleaned and flushed before filling with water.

The HVAC Contractor shall be responsible for initially setting the plants to work including:

- a) Preliminary checks to ensure that all systems and system components are in a satisfactory and safe condition before start up;
- b) Preliminary adjustment and setting of all plant and equipment consistent with eventual design performance;
- c) Carrying out testing and balancing other tests required before energizing the equipment and plant;
- d) Checking the proper functioning of the protective devices and safety valves in the installation and carrying out all necessary safety testing;
- e) Energizing and setting to work on all plants; and
- f) Initial regulation and demonstration that the installation delivers the correct rate of flow at the conditions specified in the Contract

For specialist plant or equipment, the HVAC Contractor shall arrange for it to be commissioned, certified and tested by the manufacturer's skilled commissioning engineer and/or technician.

The HVAC Contractor is required to provide advanced notice for inspection, testing and commissioning works as follows: -

- a) Off-site Inspection and Testing

An advanced notice of at least one week before commencement of the inspection or test shall be provided.

- b) On-site Inspection, Testing and Commissioning

An advanced notice of at least 4 calendar days before commencement of inspection, testing or commissioning shall be provided.

1.1.3.1.6 *Documentation and Deliverables*

The HVAC Contractor shall record all commissioning information and testing results at the witness of the Engineer or his representatives. Commissioning and testing record shall be properly checked and certified by contractor's Testing and Commissioning Engineer and signed by the Engineer or his representative who has witnessed the testing or commissioning before submission to the Engineer. The PD Contractor shall submit full commissioning and testing report to the Engineer within

14 calendar days after completion of commissioning and testing of the installation.

1.1.3.2 Testing and Commissioning - Definitions

For the purpose of this General Specification the following definitions shall apply: -

Commissioning: the advancement of an installation from the stage of static completion to full working conditions and to meet the specified requirements. This will include setting into operation and regulation of the installation.

Setting to work: the process of setting a static system into motion.

Off-site Tests: tests carried out on items of equipment at manufacturer's works or elsewhere to ensure compliance with the requirements of Specifications and/or relevant Standards or Codes of Practice (or other standards specified).

Site Tests: tests on static plant and systems (e.g. inspection and testing of welds, pressure loss duct work, etc.) to ensure correct and safe installation and operation.

Regulation: the process of adjusting the rates of fluid flow and heat transfer in a distribution system within specified tolerances as stated in the relevant CIBSE Commissioning Code.

Performance Testing: the measuring and recording of the performance of the commissioned installation.

1.1.3.3 Testing and Commissioning - General

Any defects of workmanship, materials and performance, maladjustments or other irregularities which become apparent during commissioning or testing shall be rectified by the HVAC Contractor at no cost to the Employer and the relevant part of the commissioning or testing procedure shall be repeated at the HVAC Contractor's expenses.

The entire testing and commissioning procedure shall be undertaken by the HVAC Contractor's own competent specialist staff or by a competent Independent Commissioning Specialist nominated by and acting for the HVAC Contractor and approved by the Engineer.

Where specified in the Particular Specification, the HVAC Contractor shall nominate a competent independent Specialist to conduct commissioning work.

Where specified in the Particular Specification, the HVAC Contractor shall employ an approved specialist testing and commissioning firm who shall be named in the returned Tender Documents.

At the appropriate time in the Contract, usually within the first three months, the HVAC Contractor shall furnish the Provisional Testing and Commissioning Programme, methods, procedures and formats of test records to the Engineer. This shall be updated as the work progresses towards completion.

Unless otherwise indicated, all electricity, main water and other fuels, such as town gas, necessary for the operation of the plant during preliminary runs and for full adjustments and commissioning tests will be provided at no cost by the HVAC Contractor unless otherwise specified in the Contract.

1.1.3.4 Off-Site Tests

Where the specified Standards or Codes of Practice stipulate, "type-tests" on items of equipment to demonstrate compliance shall be carried out at the manufacturer's works or elsewhere as appropriate. In all cases, "type-tests" Certificates shall be submitted in duplicate to the Engineer.

1.1.3.5 Site Tests

The HVAC Contractor shall carry out "on-site" tests in respect of all static systems to ensure safe and proper operation as conforming to the design intent. Such tests shall include test of welds and pressure tests on the hydraulic systems.

1.1.3.6 Inspection and Testing During Construction Period

1.1.3.6.1 Periodic Site Tests

Site inspections of "work in progress" will be made by the Engineer or the representative from time to time. The HVAC Contractor shall keep such inspection record for checking from time to time. Installations to be permanently covered up shall be subjected to inspection and test before cover up. During the inspection, if the Engineer discovers any work that

has been covered up before inspection and testing, this work shall be uncovered for inspection and testing to the Engineer's satisfaction. The cost involved in uncovering the work, inspecting, testing and re-concealing the work together with any consequential losses shall be paid by the HVAC Contractor at no additional cost to the Employer.

1.1.3.6.2 *Test at Factory*

The HVAC Contractor shall note that the Engineer and the Client may require witness of tests and inspections of locally and/or overseas manufactured equipment during construction at the manufacturer's works. The HVAC Contractor shall allow for making the necessary arrangements; including the visa processing by arranging for invitation letters and any other necessary items required for this travel but excluding the Engineer's and Client's travel and subsistence expenses as they shall be catered for by the Client.

1.1.3.6.3 *Factory Test Certificates*

Certificates of all hydraulic and other manufacturers' tests carried out at the manufacturers' works shall be forwarded in duplicate to the Engineer for approval. This approval shall normally be required before the materials or apparatus are dispatched from the manufacturer's works.

Where specified, the HVAC Contractor shall subject certain materials and equipment to be tested by the recognized institutions or laboratories and submit the type test certificates to the Engineer for approval.

1.1.3.7 **Documents and Data Required for Hand-Over**

1.1.3.7.1 *General*

The HVAC Contractor shall note that the system cannot be handed over until all the foregoing requirements (where applicable) have been carried out to the satisfaction of the Engineer.

1.1.3.7.2 *Test Certificates*

Before the handover inspection, the HVAC Contractor shall provide the follow test/record certificates where applicable: -

- a) Copies of manufacturer's works tests/record certificates on plant items
- b) Copies of tests/record certificates for works carried out on Site;

1.1.3.7.3 *“As-built” Drawings*

All necessary copies of “As-built” drawings as detailed in the Contract Documents and this General Specification shall be provided upon handover.

1.1.3.7.4 *Operation and Maintenance Manuals*

All necessary copies of Operating and Maintenance Manuals as detailed in the Contract and this General Specification shall be provided upon handover.

1.1.3.7.5 *Manufacturer’s Name Plate*

Every item of plant supplied by a manufacturer shall be fitted with a clearly engraved, stamped or cast manufacturer’s name plate properly secured to the plant item and showing: -

- Manufacturer’s Name;
- Serial and/or Model No.;
- Date of Supply;
- Rating/Capacity; and
- Test and Static Pressure (where applicable).

1.1.3.7.6 *Labels and Related Instructions*

Labels and notices shall be supplied and installed for all valves and piping to facilitate operation and proper maintenance of the Installation. All labels shall make cross reference to the operation and maintenance manuals and as-built drawings

All wording shall be in both Kiswahili and English. All labels shall be of adequate size as to give clearance between lettering and fixings to ensure an aesthetic arrangement on completion, and meeting with architect’s specifications.

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
1.0	<u>Preliminary & Conditions of Contracts</u>				
1.1	Allow for Factory testing of equipments	Lot	1		
1.2	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	Lot	1		
1.3	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	Lot	1		
1.4	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works and Staff training	Lot	1		
1.5	Arrangement for all factory inspections of the installation that may be required by the Engineer/Client and shall provide all instruments and equipment required for these Inspection	Lot	1		
Total carried to summary page BQ/46					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.0	<u>Air Conditioning Systems</u>				
2.1	<u>Ground Floor</u>				
2.1.1	<u>Club House</u>				
	Supply, deliver and install, test and commission Split Type air to air heat pump with wall mounted indoor unit (sound level ~ 34.0 dB) with Controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external ESU Outdoor Unit. Nominal Cooling Capacity as mentioned Manufacturers with DigitalScroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes and control panel. Dimensions: outdoor unit (920mm x 380mm x 699mm), Indoor unit (811mm x 292mm x 203mm)				
	3.6kW	No.	5		
	5.6kW	No.	1		
2.1.2	<u>Outdoor Unit</u>				
	Supply, deliver, install, test and commission complete VRF system (2830mm x 765mm x 1635mm) with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 71.0kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.1.2.1	Private Dining 1 & 5 18000BTU/HR(5.6kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H056/4R1A or approved equivalent. Power input 0.15kW, 1ph, sound level ~ 38.0dB.	No.	2		
2.1.2.2	Private Dining 2, 3 & 4 24000BTU/HR(7.1kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as LEMINAR Global model SAVRMD-H071/4R1A or approved equivalent. Power input 0.22kW, 1ph, noise level ~ 42.0dB	No.	3		
2.1.2.3	Cold Rooms 24000BTU/HR(7.1kW) wall mounted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as LEMINAR Global model SAVRWM-H071/4R1A or approved equivalent. Power input 0.14kW, 1ph, noise level 42.0dB	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.1.2.4	<p>Chef's Office</p> <p>12000BTU/HR(3.6kW) wall mounted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as LEMINAR Global model SAVRWM-H036/4R1A or approved equivalent. Power input 0.06kW, 1ph, noise level ~ 34.0dB</p>	No.	1		
2.1.2.5	<p>Restaurant</p> <p>48000BTU/HR(14.2kW) High Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as LEMINAR Global model SAVRHD-H140/4R1A or approved equivalent. Power input 0.60kW, 1ph, sound level ~ 55.0dB</p>	No.	2		
2.1.2.5.2	<p>24000BTU/HR(7.1kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as LEMINAR Global model SAVRMD-H071/4R1A or approved equivalent. Power input 0.22kW, 1ph, sound level ~42.0dB</p>	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.1.3	<p><u>Outdoor Unit</u></p> <p>Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 23.3kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (900mm x 765mm x 1625mm)</p>	No.	1		
2.1.3.1	<p>Executive Lounge, Presidential Lounge & Private Office</p> <p>18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph. noise level~38.0dB</p>	No.	5		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.1.4	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 21.2kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units: Dimensions (990mm x 765mm x 1635mm)</p>	No.	1		
2.1.4.1	<p>Secretary Desk & Open Plan Office</p> <p>12000BTU/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, noise level ~34 dB</p>	No.	4		
2.1.4.2	<p>Business Centre</p> <p>18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, noise level ~ 38dB</p>	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.1.4.3	<p>Marketing Office and Cashier Office</p> <p>12000BTU/HR(3.6kW) wall mounted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as LEMINAR Global model SAVRWM-H036/4R1A or approved equivalent. Power input 0.06kW, 1ph, sound level ~ 34.0dB</p>	No.	2		
2.2	<u>FIRST FLOOR</u>				
2.2.1	<u>Outdoor Unit</u>				
	<p>supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 89.1kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units. Dimensions (2070mm x 765mm x 1625 mm)</p>	No.	1		
2.2.1.1	<p>Auditorium</p> <p>36000BTU/HR(10.6kW) High Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRHD-H112/4R1A or approved equivalent. Power input 0.6kW, 1ph. Noise level ~ 46dB</p>	No.	6		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.2.1.2	<p>Waiting Rooms 1,2&3, Clerk's Room, Waiting Lounge & Office</p> <p>12000B1U/HR(3.6kW) 4 way Ceiling Cassette unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input 0.07kW, 1ph, Noise level 34.0dB.</p>	No.	7		
2.2.1.3	<p>Speaker's lounge</p> <p>18000B1U/HR(4.5kW) 4 way Ceiling Cassette unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, noise level ~ 36.0dB.</p>	No.	1		
2.2.2	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 75.4kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units, Dimensions (2830mm x 765mm x 1635mm)</p>	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.2.2.1	<p>Multipurpose hall</p> <p>60000BTU/HR (18.5kW) High Static Ducted Indoor Unit. The entire system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitsubishi Model SAVRHD-H220/4R1B or approved equivalent. Power input~1.05kW. 1Ph. noise level ~ 60.0dB</p>	Set	4		
2.2.3	<p>Outdoor Unit</p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitsubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 65.8kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; dimensions(2830mm x 765mm x 1635mm), weight~ 595kg</p>	No.	1		
2.2.3.1	<p>Room 1-17</p> <p>12000BTU/HR(3.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitsubishi model SAVRMD-H045/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph, sound level ~ 34.0dB.</p>	No.	16		
2.2.3.1.1					
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.2.3.1.2	18000BTU/HR(5.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote.The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H056/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph, noise level ~ 38dB	No.	1		
2.2.4	Meeting room and Boardroom				
	Supply, deliver and install, test and commission Split Type air to air heat pump with ceiling cassette type indoor unit with Controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external ESU Outdoor Unit for Boardroom Meeting rooms. Nominal Cooling Capacity as mentioned Manufacturers with DigitalScroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes and control panel.				
2.2.4.1	5.6kW: Sound level ~ 43.0dB	No.	2		
2.2.4.2	7.1kW : Sound level ~ 46.0dB	No.	1		
2.2.5	Supply and install uPVC pipe work for condensate drainage with a pressure rating of PN 6 bar, in accordance with specifications and to the particular condition and requirements of the site with all necessary wall penetrations				
2.2.5.1	Φ25mm diameter	lm	35		
2.2.5.2	Φ32mm diameter	lm	550		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.3	<u>SECOND FLOOR</u>				
2.3.1	<u>Outdoor Unit</u> Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 65.8kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units. Dimensions (2830mm x 765mm x 1635mm)	No.	1		
2.3.1.1	Committee room 5,6 & 8, Speaker's Gallery, Public Gallery, Media Gallery 18000B1U / HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level ~ 38.0dB	No.	13		
2.3.1.2	Committee Room 7 24000B1U / HR(7.1kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H071/R1AX or approved equivalent. Power input ~ 0.10kW, 1ph, Sound level ~42.0dB	No.	1		
Total carried to summary page BQ/34					-

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.3.2	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 71.0kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units. (Dimensions 2830mm x 765mm x 1635mm)</p>	No.	1		
2.3.2.1	<p>Conference Room 1,2,3 & 4</p> <p>24000BTU/HR(7.1kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H071/R1AX or approved equivalent. Power input ~ 0.10kW, 1ph, sound level ~ 42.0dB</p>	No.	12		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.3.3	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 71.0kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; dimensions (2830mm x 765mm x 1635mm)</p>	No.	1		
2.3.3.1	<p>Rooms 19,20,21,22,24,27-36</p> <p>12000BTU/HR(3.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H045/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph, sound level ~ 34.0dB</p>	No.	14		
2.3.3.2	<p>Rooms 23,25 & 26</p> <p>24000BTU/HR(6.0kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H071/4R1A or approved equivalent. Power input 0.22kW, 1ph, sound level ~ 42.0dB</p>	No.	3		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.4	<u>THIRD FLOOR</u>				
2.4.1	<u>Outdoor Unit</u> Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 82.2kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; dimensions (3620mm x 765mm x 1635mm)	No.	1		
2.4.1.1	Parliamentary Debating Chambers 18000BTU/HR(5.6kW) Medium Static Ducted indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H056/4R1A or approved equivalent. Power input 0.15kW, 1ph, sound level ~ 38.0dB	No.	9		
2.4.1.2	Hall 10 & 9 24000BTU/HR(7.1kW) Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H071/R1AX or approved equivalent. Power input ~ 0.10kW, 1ph, noise level ~42.0dB.	No.	5		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.4.1.3	<p>Speaker's Lounge</p> <p>12000BTU/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level ~ 34.0dB.</p>	No.	2		
2.4.1.4	<p>Clerk's Lounge</p> <p>18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or equivalent. Power input ~ 0.08kW, 1ph, sound level ~38.0dB.</p>	No.	1		
2.4.2	<p><u>Outdoor Unit</u></p> <p>Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 23.3kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (990mm x 765mm x 1635mm)</p>	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.4.2.1	<p>Reading Room & Database Access</p> <p>18000B1U/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level~38.0dB.</p>	No.	3		
2.4.2.2	<p>Librarian's Office & Journals & Periodicals rooms</p> <p>12000B1U/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level~34.0dB.</p>	No.	3		
2.4.3	<p><u>Outdoor Unit</u></p> <p>Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 75.4kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2830mm x 765mm x 1635mm)</p>	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.4.3.1	Rooms 37-56 18000BTU/HR(5.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H045/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph, sound level ~38.0dB .	No.	19		
2.5	<u>FOURTH FLOOR</u>				
2.5.1	<u>Outdoor Unit</u> Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 65.8kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2830mm x 765mm x 1635mm)	No.	1		
2.5.1.1	Committee rooms 4,5, 6, Media Gallery, Public Gallery, Speaker's Gallery 18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level ~ 38.0dB.	No.	15		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.5.2	<p>Outdoor Unit</p> <p>Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 44.5kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (9120mm x 765mm x 1625mm)</p>	No.	1		
2.5.2.1	<p>Head of Research, Secretary, Research hub and Control Room</p> <p>12000BTU/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level ~34 dB</p>	No.	7		
2.5.2.2	<p>Simulation Room and Staff Boardroom</p> <p>18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level~38.0dB.</p>	No.	5		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.5.3	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 56.2kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2130mm x 765mm x 1635mm)</p>	No.	1		
2.5.3.1	<p>Lobby and Lounge 1-13</p> <p>12000BTU/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level~34.0dB.</p>	No.	14		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.6	<u>FIFTH FLOOR</u>				
2.6.1	<u>Outdoor Unit</u> Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 82.2kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (3620mm x 765mm x 1635mm)	No.	1		
2.6.1.1	Hot, DEP Office & Board Room 6 12000BTU / HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level ~ 34 dB	No.	9		
2.6.1.2	Board Room 6, 7, Dep Office and Room 18000BTU / HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level~38.0dB.	No.	12		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.6.2	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 51.4kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2480mm x 765mm x 1635mm)</p>	No.	1		
2.6.2.1	<p>Office, Reception, Executive Board, PA, CHP 02, CHP-06, CHP-02,</p> <p>12000BTU/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level ~ 34.0dB.</p>	No.	6		
2.6.2.2	<p>PA & Reception</p> <p>12000BTU/HR(3.6kW) Wall Mounted Indoor units inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level ~ 34.0dB.</p>	No.	8		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.6.2.3	<p>CHP-01 & CHP-06</p> <p>18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi as model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level ~ 38.0dB.</p>	No.	2		
2.6.3	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 56.2kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2830mm x 765mm x 1635mm)</p>	No.	1		
2.6.3.1	<p>Rooms 15-28</p> <p>12000BTU/HR(3.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H045/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph, sound level~34.0dB.</p>	No.	14		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.7	<u>SIXTH FLOOR</u>				
2.7.1	<u>Outdoor Unit</u> Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitsubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 11.03kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; dimensions (940mm x 340 x 1220mm)	No.	1		
2.7.1.1	<u>Manager's Office & Trainer's Office</u> 12000BTU/HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitsubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, sound level ~34.0dB.	No.	2		
2.7.1.2	<u>Reception</u> 18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitsubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level~38.0dB.	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.7.2	<p><u>Outdoor Unit</u></p> <p>Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 65.8kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2830mm x 765mm x 1635mm)</p>	No.	1		
2.7.2.1	<p>Rooms 29-42</p> <p>12000BTU/HR(3.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H045/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph, sound level ~34.0dB.</p>	No.	14		
2.7.2.2	<p>Beauty Parlour, Reception & Barber</p> <p>18000BTU/HR(5.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level 38.0dB.</p>	No.	3		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.8	<u>SEVENTH FLOOR</u>				
2.8.1	<u>Outdoor Unit</u> Supply, deliver, install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 71.0kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2830mm x 765mm x 1635mm)	No.	1		
2.8.1.1	<u>Private Dining 1 & 2</u> 18000BTU/HR(5.6kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H056/4R1A or approved equivalent. Power input 0.15kW, 1ph, sound level~38.0dB	No.	2		
2.8.1.2	<u>Restaurant</u> 48000BTU/HR(14.2kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H140/4R1A or approved equivalent. Power input 0.60kW, 1ph, sound level~50dB	No.	4		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.8.1.3	Chef's Office 12000BTU/HR(3.6kW) wall mounted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRWM-H036/4R1A or approved equivalent. Power input 0.06kW, 1ph, sound level ~ 34.0dB	No.	1		
2.8.1.4	Coldrooms 24000BTU/HR(7.1kW) wall mounted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRWM-H071/4R1A or approved equivalent. Power input 0.14kW, 1ph, sound level ~ 42.0dB	No.	1		
2.8.2	<u>Outdoor Unit</u> Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 71.0kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (2830mm x 765mm x 1635mm)	No.	1		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.8.2.1	Rooms 42,43 47-48, Bedrooms 1&2, 12000BTU/HR(3.6kW) Medium Static Ducted Indoor unit inclusive of wireless remote.The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H045/4R1A or approved equivalent. Power input ~ 0.15kW, 1ph,sound level ~34.0dB.	No.	8		
2.8.2.2	Rooms 45,46,49,50, Master Bedrooms 1&2, 18000BTU/HR(5.6kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H056/4R1A or approved equivalent. Power input 0.15kW, 1ph,sound level ~ 38.0dB	No.	6		
2.8.2.3	Penthouse 1 & 2 24000BTU/HR(7.1kW) wall mounted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRWM-H071/4R1A or approved equivalent. Power input 0.14kW, 1ph,sound level~42.0dB	No.	2		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.9	<p><u>Outdoor Unit</u></p> <p>Supply, deliver,install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 23.3kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (990mm x 765mm x 1635mm)</p>	No.	1		
2.9.1	<p>Room 51 to 56</p> <p>12000BTU/HR(3.6kW) Medium Static Ducted indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRMD-H045/4R1A or equivalent. Power input 0.15kW, 1ph, sound level~34.0dB</p>	No.	6		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.10	<p>Outdoor Unit Supply, deliver and install, test and commission complete VRF system with controllers and all accessories as Rheem / Daikin / Mitshubishi complete with a matching external EVR Outdoor Unit Nominal Cooling Capacity 37.7kW as mentioned Manufacturers with Digital Scroll Compressors, Refrigerant R410A or R-407C with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, concrete or metal frame bases, refrigerant piping, insulation, aluminum jacket for exposed pipes, controls, control panel to serve the following indoor units; Dimensions (1340mm x 765mm x 1635mm)</p>	No.	1		
2.10.1	<p>Security Officers, Security systems control room and Ups Room 18000BTU / HR(4.5kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The unit shall operate on R410a refrigerant or any other non-ozone depleting refrigerant. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H056/R1AX or approved equivalent. Power input ~ 0.08kW, 1ph, sound level~38 0dB</p>	No.	3		
2.10.2	<p>Chief Security officer & Assistant Chief Security Officer room 12000BTU / HR(3.6kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitshubishi model SAVRCA-H036/R1AX or approved equivalent. Power input ~ 0.07kW, 1ph, noise level~34.0dB.</p>	No.	2		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.10.3	Boardroom and Server Room 24000BTU/HR(7.1kW) 4 way Ceiling Cassette Indoor unit inclusive of wireless remote. The system shall be able to start automatically after power failure with 3 minutes delay. The unit shall be as Rheem / Daikin / Mitsubishi model SAVRCA-H071/R1AX or approved equivalent. Power input ~ 0.10kW, 1ph, sound level~42.0dB.	No.	5		
2.11	Supply, deliver and install VRF System insulated copper refrigerant pipes and electrical cable from external unit, up to each internal unit, with all necessary wall penetrations and with all other accessories including but not limited to hangers, supports, vibration isolators, insulation, aluminum jacket for exposed pipes (tenant has to install internal units, internal cabling, control panel, complete work and start of the system)				
2.11.1	Refrigerant Piping of diameter 6.4mm	Lm	725		
2.11.2	Refrigerant Piping of diameter 12.7mm	Lm	725		
2.11.3	Refrigerant Piping of diameter 15.9mm	Lm	590		
2.11.4	Refrigerant Piping of diameter 19.1mm	Lm	460		
2.11.5	Refrigerant Piping of diameter 22.2mm	Lm	270		
2.11.6	Refrigerant Piping of diameter 25.4mm	Lm	65		
2.11.7	Refrigerant Piping of diameter 28.6mm	Lm	220		
2.11.8	Refrigerant Piping of diameter 34.9mm	Lm	190		
2.11.9	Refrigerant Piping of diameter 41.3mm	Lm	90		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.12	Supply, install, test and commission hot dipped zinc coated steel sheet ducts air distribution system including plenums of various Thickness as Technical description to conform to the requirements of SMACNA HVAC Duct construction standards and to the particular requirements of the site with all necessary wall penetrations. Allow for all duct fittings, dampers, hangers, supports, vibration isolators as required to complete the distribution system and all necessary fittings, including but not limited to tapped ends, access panels, mesh openings, flexible connectors and accessories and fixing required for the satisfactory execution operation and completion of the work.	SqM	890		
2.13	Supply, install, test and commission mineral wool duct insulation to conform to the particular requirements of the site. Allow for all duct fittings, plenums as required to complete the air distribution system and all necessary fittings and accessories, aluminium jacket for exposed insulated ductwork and fixing required for the satisfactory execution operation and completion of the work.	SqM	890		
2.14	Supply, install, test and commission flexible air ducts as Technical description to conform to the particular requirements of the site. Allow for all duct fittings hangers, supports as required to complete the air distribution system and all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
2.14.1	Φ125 diameter	Lm	225		
2.14.2	Φ150 diameter	Lm	35		
2.14.3	Φ200 diameter	Lm	115		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.15	Supply deliver, install, test and commission Ceiling Supply diffuser (CSD) including volume damper with all accessories but not limited to hangers, supports and fixing required for the satisfactory execution operation and completion of the work				
2.15.1	CSD 450 X 450 mm	No.	33		
2.16	Supply deliver, install, test and commission Ceiling Return grille (CRG) including volume damper with all accessories but not limited to hangers, supports and fixing required for the satisfactory execution operation and completion of the work				
2.16.1	CRG 450 X 450 mm	No.	11		
2.17	Supply deliver, install, test and commission Ceiling Linear 3 Slot Supply/Return Diffuser including volume damper with all accessories but not limited to hangers, supports and fixing required for the satisfactory execution operation and completion of the work				
2.17.1	3 slot linear supply/return	No.	272		
2.18	Supply deliver, install, test and commission Wall Mounted FA Intake Louver for outdoor use with all accessories including but not limited to hangers, supports, vibration isolators and fixing required for the satisfactory execution operation and completion of the work.				
2.18.1	600 X 400 mm	No.	8		
Total carried to summary page BQ/34					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
2.19	Supply, deliver to site, install, test and commission PVC condensate drain pipes allowing for the labour required for chasing in walls and the necessary fittings required for a complete installation.				
2.19.1	20mm diameter UPVC condensate drain	Lm	20		
2.19.2	25mm diameter UPVC condensate drain	Lm	10		
2.19.3	32mm diameter UPVC condensate drain	Lm	8		
2.20	DEHUMIDIFIERS				
2.20.1	Library dehumidifiers (Stand alone)				
	Supply, Install and Comission a stand alone dehumidifier of capacity 40 pints/ day with comfortable handles and a cover that permits convenient removal and carrying when it's full. Other Specifications should be as perclause 6.04 of the technical specifications	No.	4		

Total carried to summary page BQ/34

Main Summary Page for Air Conditioning

ITEM	DESCRIPTION	AMOUNT (KES)
2.0	Total Brought forward from BQ pg. 2 Total Brought forward from BQ pg. 3 Total Brought forward from BQ pg. 4 Total Brought forward from BQ pg. 5 Total Brought forward from BQ pg. 6 Total Brought forward from BQ pg. 7 Total Brought forward from BQ pg. 8 Total Brought forward from BQ pg. 9 Total Brought forward from BQ pg. 10 Total Brought forward from BQ pg. 11 Total Brought forward from BQ pg. 12 Total Brought forward from BQ pg. 13 Total Brought forward from BQ pg. 14 Total Brought forward from BQ pg. 15 Total Brought forward from BQ pg. 16 Total Brought forward from BQ pg. 17 Total Brought forward from BQ pg. 18 Total Brought forward from BQ pg. 19 Total Brought forward from BQ pg. 20 Total Brought forward from BQ pg. 21 Total Brought forward from BQ pg. 22 Total Brought forward from BQ pg. 23 Total Brought forward from BQ pg. 24 Total Brought forward from BQ pg. 25 Total Brought forward from BQ pg. 26 Total Brought forward from BQ pg. 27 Total Brought forward from BQ pg. 28 Total Brought forward from BQ pg. 29 Total Brought forward from BQ pg. 30 Total Brought forward from BQ pg. 31 Total Brought forward from BQ pg. 32 Total Brought forward from BQ pg. 33	
Total carried to summary page BQ/46		

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ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
3	<u>Ventilation Systems</u>				
3.1	Exhaust Fans				
	Supply, deliver, install, test and commission exhaust fan EF with Cast aluminium alloy hub and adjustable blades. Galvanised steel casing manufactuerd in accordance with DIN EN ISO 1461 and should be sound insulated. IP55 415, 50Hz 3 phase motor, insulation class F (CO ventilation) according to EN 60034-5. the units should be tested in fan test rig in accordance with DIN ISO 5801 and AMCA 210-99. The fan should be BMS Ready, to include isolators including electrical connections and wiring from fan to starter and from starter to fan, hangers, supports, controls, control panel and fixing required for the satisfactory execution operation and completion of the work. The sizes to be as;				
3.1.1	50615m3/h - 300 pa	No.	1		
3.1.2	2835 m3/h - 150 pa	No.	3		
3.1.3	4016m3/h-150 pa	No.	2		
3.1.4	4253m3/h-150 pa	No.	2		
3.1.5	1417m3/h-100pa	No.	1		
3.1.6	3071m3/h - 150 pa	No.	2		
3.1.7	2000m3/h -100 pa	No.	3		
3.1.8	2000m3/h - 150 pa	No.	2		
3.1.9	500m3/h - 100 pa	No.	6		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
Total B/F from Previous Page					
3.2	<p>Fresh Air Intake Fan</p> <p>Supply, deliver, install, test and commission Fresh Air Intake Fan (FAF) with Cast aluminium alloy hub and adjustable blades. Galvanised steel casing manufactured in accordance with DIN EN ISO 1461 and should be sound insulated. IP55 415, 50Hz 3 phase motor, insulation class F (CO ventilation) according to EN 60034-5. The units should be tested in fan test rig in accordance with DIN ISO 5801 and AMCA 210-99. The fan should be BMS Ready, to include isolators including electrical connections and wiring from fan to starter and from starter to fan, hangers, supports, controls, control panel and fixing required for the satisfactory execution operation and completion of the work. The sizes to be as;</p>				
3.2.1	<p>6000m³/h - 150 pa</p> <p>Supply, deliver, install, test and commission Kitchen Exhaust fan with backdraft shutter, Cast aluminium alloy hub and adjustable blades. Galvanised steel casing manufactured in accordance with DIN EN ISO 1461 and should be sound insulated. IP55 415, 50Hz 3 phase motor, insulation class F (CO ventilation) according to EN 60034-5. The units should be tested in fan test rig in accordance with DIN ISO 5801 and AMCA 210-99. The fan should be BMS Ready, to include isolators including electrical connections and wiring from fan to starter and from starter to fan, hangers, supports, controls, control panel and fixing required for the satisfactory execution operation and completion of the work. The sizes to be as;</p>	No.	4		
3.3	<p>2500 m³/h @ 110 pa</p> <p>Supply, deliver, install, test and commission Kitchen Exhaust fan with backdraft shutter, Cast aluminium alloy hub and adjustable blades. Galvanised steel casing manufactured in accordance with DIN EN ISO 1461 and should be sound insulated. IP55 415, 50Hz 3 phase motor, insulation class F (CO ventilation) according to EN 60034-5. The units should be tested in fan test rig in accordance with DIN ISO 5801 and AMCA 210-99. The fan should be BMS Ready, to include isolators including electrical connections and wiring from fan to starter and from starter to fan, hangers, supports, controls, control panel and fixing required for the satisfactory execution operation and completion of the work. The sizes to be as;</p>	No.	1		
3.3.1		No.	1		
3.3.2	<p>5000m³/h @ 150 pa</p>	No.	2		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
Total B/F from Previous Page					
<p>3.4</p> <p>Basement Fan</p> <p>3.4.1</p>	<p>Supply, deliver and install two speed (21000m³/h-32000m³/h @ 200Pa), 300°C/2h, garage FANS with all accessories to include isolators including electrical connections and wiring from fan to starter and from starter to fan hangers, supports, vibration isolators, controls, control panel and fixing required for the satisfactory execution operation and completion of the work. Galvanised steel casing manufactuerd in accordance with DIN EN ISO 1461 and should be sound insulated. IP55 415, 50Hz 3 phase motor, insulation class F (CO ventilation) according to EN 60034-5, the units should be tested in fan test rig in accordance with DIN ISO 5801 and AMCA 210-99. The fan should be BMS Ready</p> <p>Supply, deliver and install Smoke Extraction Control Panel and CO sensors for monitoring and control of exhaust fans (two speed (21000m³/h-32000m³/h @ 200Pa), 300°C/2h, with all accessories including but not limited to hangers, supports, vibration isolators, controls, control panel and fixing required for the satisfactory execution operation and completion of the work</p>	<p>No.</p> <p>No.</p>	<p>4</p> <p>1</p>		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
Total B/F from Previous Page					
3.6	Duct work Supply and install, Test and Commissioning of GI Ducting Factory Fabricated with Duct Mate Flanges as per specifications. The duct work should comply to BS 4844 & NFPA 90A for supply air, Inclusive of supports, C channel or Tie Angle and Rods, hanger threaded rods, clamp plates, trapeze angle or channel hanger iron, etc as specified in NFPA 90A. The GSM should be 180 GSM coating. Support spacing should be as in the specification or BS EN 15727:2010, NFPA 90A.(Allow for fittings as shown in the drawings and details)				
3.6.1	0.8 mm minimum thickness	m ²	432		
3.6.2	1.0 mm minimum thickness	m ²	1107		
3.6.3	1.2 mm minimum thickness	m ²	1819		
3.7	Flexible Duct Supply, install, test and commission flexible air ducts as Technical description to conform to the particular requirements of the site. Allow for all duct fittings hangers, supports as required to complete the air distribution system and all necessary fittings and accessories and fixing required for the satisfactory execution operation and completion of the work				
3.7.1	Φ125 diameter	Lm	175		
3.7.2	Φ150 diameter	Lm	50		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
Total B/F from Previous Page					
3.8	Grilles and Diffusers				
	Supply, deliver, install, test and commission Systemair ADQ-4-R1 aluminium Wall Exhaust and Intake Linear Grille (WRG) with plenum, with all accessories including but not limited to hangers, supports, vibration isolators and fixing required for the satisfactory execution operation and completion of the work				
3.8.1					
3.8.1.1	300 x 200 mm	No.	384		
3.8.1.2	500 x 300 mm	No.	312		
	Supply, deliver, install, test and commission Systemair ADQ-4-R1 Discvalve Intake Grille (DVR), with all accessories including but not limited to hangers, supports, vibration isolators and fixing required for the satisfactory execution operation and completion of the work				
3.8.2					
3.8.2.1	Φ125 diameter	No.	48		
3.9	<i>Square Diffuser & Grille (suppy and extract system)</i>				
	Supply, deliver, install, test and commission Systemair ADQ-4-R1Aluminum 4 way blow diffuser with the following nect sizes				
3.9.1	150 x 150 mm	No.	56		
3.9.2	350 x 350 mm	No.	24		
3.9.3	450 x 450 mm	No.	26		
3.9.4	600 x 600 mm	No.	26		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
Total B/F from Previous Page					
3.10	Door Grille				
3.10.1	Supply, installation of 300 x 250 mm door grilles, with all accessories including but not limited to hangers, supports, vibration isolators and fixing required for the satisfactory execution operation and completion of the work as AEROVAC or equal and approved	No	56		
3.11	Louvres				
3.11.1	Intake Louvres Supply deliver, install, test and commission wall mounted Systemair type WL Aluminium FA Intake Louver for outdoor use with all accessories including but not limited to hangers, supports, vibration isolators and fixing required for the satisfactory execution operation and completion of the work., Filters and non-return dampers for the following Louvre Dimensions. The Filters should have Filtration media of Class F5 or higher as defined by CEN standard EN 779-2002,particles air filters for general ventilation. Filtration media with a minimum dust spot efficiency of 30% or higher and greater 90% arrestance on a particle size of 3-10µg.				
3.11.1.1	600 mm x 400 mm	No.	6		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
Total B/F from Previous Page					
3.11.2	Discharge Louvre Systemair type WL Aluminium discharge Louvers, Filters and non-return dampers for the following Louvre Dimensions. The Filters should have Filtration media of Class F5 or higher as defined by CEN standard EN 779-2002, particles air filters for general ventilation. Filtration media with a minimum dust spot efficiency of 30% or higher and greater 90% arrestance on a particle size of 3-10µg. Provide following size				
3.11.2.1	600 mm x 400 mm	No.	7		
3.12	Dampers				
3.12.1	Moterised Fire Damper Supply and install moterised fire damperwith fusible link GI construction with calcium cilicate blades. The Fire damper shall have 120 min rating and tested according to EN 1366-2. The unit shall be BMS compatible				
3.12.1.1	1200 x 700 mm	No.	12		
3.12.2	Moterised Fresh Air Damper Supply and install moterised fresh air damper with fusible link GI construction with calcium cilicate blades. The damper shall have 120 min rating and tested according to EN 1366-2. The unit shall be BMS compatible with the folowing sizes				
3.12.2.1	1200 x 700 mm	No.	12		
Total C/F to the Next Page					-

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
	Total B/F from Previous Page				
3.12.3	Volume Control Dampers				
	Supply,Install, Test and Commision Systemair Duct type volume control dampers of GI Construction with BMS compatible and should operate in 5 different modes with the folowing sizes				
3.12.3.1	900 x 400 mm	No.	18		
3.12.3.2	800 x 450 mm	No.	18		
3.12.3.3	800 x 400 mm	No.	22		
3.12.3.4	700 x 400 mm	No.	23		
3.12.4	Back Draft Dampers				
	Supply,Install, Test and Commision Systemair Duct type back draft dampers dampers of GI Construction with BMS compatible and should operate in 5 different modes with the folowing sizes				
3.12.4.1	1200 x 700 mm	No.	12		
3.12.5	Pressure Relief Dampers				
	Supply,Install, Test and Commision Systemair Duct pressure relief dampers dampers of GI Construction with BMS compatible and should operate in 5 different modes with the folowing sizes				
3.12.5.1	1200 x 700 mm	No.	12		
3.13	Allow for all electrical works including wiring to the fans from the local isolators and connection to the control panel	Lot	1		
Total carried to summary page BQ/46					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT KES
4.0	<u>Refuse Chute Installations</u>				
4.1	Extract Fan				
	Supply, Install, Test and Commission axial fan with Cast aluminium alloy hub and adjustable blades. Galvanised steel casing manufactured in accordance with DIN EN ISO 1461 and should be sound insulated. IP55 415, 50Hz 3 phase motor, insulation class F (CO				
4.1.1	ventilation) according to EN 60034-5. The units should be tested in fan test rig in accordance with DIN ISO 5801 and AMCA 210-99. The fan should be BMS Ready, to include isolators including electrical connections and wiring from fan to starter and from starter to fan. The sizes to be as;				
4.1.1.1	840m ³ /h, 100pa	No.	2		
4.2	Trash Chute				
	Supply and install a 600 mm diameter trash chute manufactured from 2 mm thick galvanised mild steel sheet including ventilation flue pipe for the refuse chute. It shall terminate at the roof floor. The total length of the chute is 46m long				
4.2.1		SQM	206		
4.3	Access door & Hopper				
	Supply and install 400 x 450 mm hinged and rodable access door with retractable mechanism on the appropriate floor as shown on the contract drawing.				
4.3.1		No.	24		
4.4	Metalic Waste Bin				
	Supply and install a portable 9000 liter waste-bin in the refuse room made of stainless steel				
4.4.1		No.	2		
Total C/F to the Next Page					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT KES
Total B/F from Previous Page					
4.5	Waste Compactor Supply, install, test and commission waste compactor with the following performance characteristics: cycle time-37 seconds, total nominal force-161kN, total maximum force - 201kN, maximum ram pressure -144kPa, ram penetration - 165mm. Hydraulic pump- 38.75L/ min, nominal pressure-1627.5bar, maximum pressure-2158.6bar as model RJ-100SC Ultra or approved equivalent	No.	1		
4.6	Allow for any other sundries including supports and fittings to make the solid waste chute functional.	Sum	1		
Total carried to summary page BQ/46					

ITEM	DESCRIPTION	UNIT	QTY.	RATE (KES)	AMOUNT (KES)
5.0	<u>Staircase Pressurization</u>				
5.1	Axial Flow Fans Supply, Install, Test and Commission axial fan with Cast aluminium alloy hub and blades. Galvanised steel casing made in accordance with DIN EN ISO 1461 coupled with sound insulation. 415V, 50Hz, 3 PH motor, insulation class F (CO ventilation) according to EN 60034-5. Units should be tested in accordance with DIN ISO 5801 and AMCA 210-99. Provide the following sizes.				
5.1.1	11.4m ³ /s, 300pa	No	5		
5.2	Ducting Supply and Install fire approved ducting of the following thicknesses. The duct should be SANS 193 approved or EN 12101-3 approved				
5.2.1	1 mm minimum thickness	SQM	487		
5.3	Supply Air Register Supply and Install wall mounted Fire resistant Air Registers capable of 2.5 m ³ /s flow rate complete with integrated Volume Control Dampers (capable of operating in five different modes). Provide for the following sizes.				
5.3.1	350 x 350 mm	No	50		
5.4	Allow for any other sundries including supports and fittings to make the staircase pressurisation functional.	Sum	1		
Total carried to summary page BQ/46					

ITEM	DESCRIPTION	AMOUNT (KES)
1.0	Total for Preliminary & Conditions of Contracts B/F from BQ pg. 1	
2.0	Total for Air Conditioning Systems B/F from BoQ pg 34	
3.0	Total for Ventilation Systems B/F from BQ page 42	
4.0	Total for Refuse Chute B/F from BQ page 44	
5.0	Total for Staircase Pressurisation B/F from BQ page 45	
Total Carried to Form of Tender		

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
1	Preliminary & Conditions of Contract				
1.1	Allow for mobilization and setting up stores, tools and all necessary equipment on site	1	Item		
1.2	Allow for co-ordination of works with the Main Contractor and other Sub-contractors	1	Item		
1.3	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	1	Item		
1.4	Arrangement for all inspections and tests of the installation that may be required by the Engineer/Client and shall provide all instruments and equipment required for these tests	1	Item		
1.5	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	1	Item		
1.6	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works.	1	Item		
1.7	Allow for the cost of Performance Bond and Insurance of the Works in accordance with the Conditions of Contract.	1	Item		
1.8	Allow for on-site Training of the Operators for specialised equipment	1	Item		
1.9	Allow for all the preliminaries relating to this contract as specified	1	Item		
1.10	Allow for testing and commissioning to the satisfaction of the Engineer.	1	Item		
Total Carried to main summary Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
A	<u>CPST</u>				
	<u>Water Reticulation</u>				
1.0	Supply of HDPE materials- All Polyethylene material shall be 16.0 KG/SQ.CM (unless otherwise stated) suitable for butt fusion jointing and the rate shall include for supply and delivery to the work site of all pipes, fittings & specials including all other associated accessories such as gaskets, backing rings (to suite PN 16 flange), bolts and nuts, etc. required for complete installation.				
	<u>HDPE Pipework</u>				
1.0.1	Ø110mm OD diameter HDPE pipe work	858	LM		
1.0.2	ditto Ø63mm	700	LM		
	<u>Extra over HDPE Pipework for the following:</u>				
	<u>Elbow</u>				
1.0.4	Ø110mm HDPE diameter bend/elbow	56	No.		
1.0.5	Ditto Ø63mm	63	No.		
Total Carried to main summary Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
	<u>Tee</u>				
1.0.7	Ø110mm HDPE diameter tee	44	No.		
1.0.8	ditto Ø63mm	40	No.		
	<u>Saddle Clamp</u>				
1.0.10	HDPE 110mm x 63mm	36	No.		
	<u>HDPE End Caps</u>				
1.0.12	HDPE Ø110mm	26	No.		
1.0.13	Ditto Ø63mm	30	No.		
	<u>Hex Nipple</u>				
1.0.15	2" BSP Brass Threaded Hex Nipple	49	No.		
	<u>Male Adapter</u>				
1.0.17	63mm x 2" BSP brass threaded male adapter	49	No.		
	<u>HDPE Quick Coupling</u>				
1.0.19	HDPE Ø110mm	30	No.		
1.0.20	Ditto Ø63mm	40	No.		
Total Carried to main summary Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
1.1	<u>Lawn (Pop Up) Sprinklers</u>				
1.1.1	Pop-up Rotor type Sprinkler - Full Circle Operating Head 4 bar - Radius 14m Stainless Steel Riser - Operation of flow 3.23m ³ /h as " Hunter 1-20 " or apprived equivalent	64	No.		
1.1.2	63 X 3/4" PE saddle clamp	64	No.		
1.1.3	Swing Joint as HSJ-0	64	No.		
1.2	<u>Valve & Irrigation Controllers</u>				
1.2.1	12 Station Hunter Pro-IC Controller C/W Adapter	4	No.		
1.2.2	Hunter ICV Solenoid Valve 2"	24	No.		
1.2.3	Armored Cables to Valve(from pump room to solenoid valves)	1	lot		
1.2.4	Wireless Level Sensor	1	No.		
1.2.5	Valve box for Solenoid valve housing as Hunter " MB-0811-G " or approved equivalent	30	No.		
1.2.6	110mm wireless water water flow sensor as " Hunter " or approved equivalent	2	No.		
1.2.7	110mm Bulk water meter	1	No.		
1.2.8	110 mm gate valve as " Pegler "	2	No.		
1.2.9	Rain sensor as " Hunter WR-CLIK "	2	No.		
Total Carried to main summary Page					

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KES)	AMOUNT (KES)
1.3	Insulating tapes	1	No.		
1.4	<u>Civil Work</u>				
1.4.1	Trenching, Backfilling, laying and fitting of pipes, valves and sprinklers	1	Lot		
1.5	<u>Irrigation Pumpset</u>				
	Duty stand-by booster set Flow rate 60m ³ /h Head 7.5 bar as Wilo Sibooast Smart 2 Helix VE 5205-ES or equal and approved equivalent	1	Set		
Total Carried to main summary Page					

ITEM	DESCRIPTION	AMOUNT (KES)
1	Total from BoQ page 1	
2	Total from BoQ page 2	
3	Total from BoQ page 3	
4	Total from BoQ page 4	
5	Total from BoQ page 5	
6	Allow for 5% Contingency	
Total Carried to Form of Tender		

ITEM	DESCRIPTION	QTY.	UNIT	RATE (KSH)	AMOUNT (KSH)
1.00	<p>SWIMMING POOL INSTALLATIONS</p> <p><u>Supply, deliver and install the following equipment as described:</u></p> <p>Swimming Pool pump</p> <p>A Self priming swimming pool pumps, capable of handling 21m³/hr against a static head of 16 metres. Pumps to be complete with the following: -</p> <p>Cast iron end shield</p> <p>Drainage plug</p> <p>Multi directional barrel unions on discharge and suction</p> <p>Ø100mm PVC line strainer</p> <p>Ø65mm flowmeter</p> <p>Thermal and overload motor protection</p> <p>Motor: TEFC; IP55; IC F;</p> <p>Pumps to be as "Davey" PM swimming pool pumps, model PM 450 with a power consumption of 1.7 Kw, 1Ph, 240V, 50Hz or equal and approved</p> <p>Swimming Pool Filters</p> <p>B High strength fibre glass pool filters with a minimum filter area of 0.44 square metres and a maximum volume flow rate of 22 m3/hr complete with the following;</p> <p>40mm diameter multi port valve</p> <p>40mm diameter, 0 - 10bars, dial pressure gauge</p> <p>Automatic air bleeding system</p> <p>Quick release perspex lid for inspection</p> <p>Boss connections for inlets and outlets</p> <p>Maximum allowable working pressure, 2.0bars Test pressure, 3.0bars Dimensions: Height = 1060mm; Diameter = 770mm (Approx.) Weight: Nett = 21Kg; Gross = 420Kg</p> <p>Filters shall be as "DAYLIFF" Model DX 750 or equal and approved.</p>	No.	2		-
	<p>Total Carried Forward to Collection page</p>				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				KSHS	KSHS.
	Vacuum Point and Plug				
A	Heavy duty chrome plated vacuum point and plug on brass body with 40mm diameter vacuum hose connection. As "CERTIKIN" or equal and approved	No.	1		
B	Certikin Vacuum 8 Wheel Sweeper	No	1		
C	Baracuda Automatic Pool Cleaner c/w Prefilter and 6No. 1.2m Hoses	No	1		
D	Certikin Vacuum Hose 15m	No	1		
	Inlet Spreaders				
E	50mm Certikin Moulded PVC Inlets fitted with Adjustable Eyeball	No	6		
	Pool Sumps				
F	Dayliff 300mm x 300mm GRP Suction Grating.	No	2		
	Pool Ladders				
G	Certikin Eco 4-tread stainless steel ladder for the deep end.	No	1		
	Decklevel grilles				
H	Dayliff 250mm (per metre) Decklevel Grilles	LM	50		
	Pumps control pannel				
I	Dayliff Electronic Control Panels for the pumps.	No	1		
	Pool chemicals				
J	Chemical start up kit comprising of 30litres acid, 20kg PH plus, 25kg chlorine 65%, 20kg chlorine 90%, 10 litres magic touch, 5litres HTH pool sparkle, and 5kg Pool water Stabiliser.	Item	1		
	Pool disinfection equipment				
K	Pool disinfection equipment to be as "Monarch pool system" salt chlorinators. Model Ecosalt BMSC20 or equal approved equivalent.	No	1		
TOTAL CARRIED FORWARD TO COLLECTION PAGE : M/S					

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				KSHS	KSHS.
	uPVC PIPEWORK				
	<u>Supply, deliver and install uPVC class "D" high pressure pipework conforming to BS 3505 and fittings to BS 4346</u>				
	<u>Tenderers MUST ALLOW in their pipework prices for all couplings, connectors, joints, unions, thrust blocks, pipe flanges, paddle flanges where pipework crosses structural walls, adaptors for uPVC to cast iron fittings, fixing clips, plugged and screwed holderbats, etc as required in running lengths of pipework and for satisfactory installation</u>				
A	40mm ditto	LM	15		
B	50mm ditto	LM	11		
C	65mm ditto	LM	60		
D	40mm diameter uPVC bends	No.	2		
E	50mm ditto	No.	1		
F	65mm ditto	No	5		
G	50 X50mm diameter uPVC Equal Tee	No.	1		
H	65 X50mm diameter uPVC Enequal Tee	No.	2		
I	65x50 mm diameter uPVC reducer	No.	1		
J	40mm dia uPVC valve male screw adaptor	No.	2		
K	65mm dia uPVC valve male screw adaptor	No.	8		
	Paddle Flanges				
L	40 mm diameter PVC paddle flanges	No.	1		
M	50 mm diameter PVC paddle flanges	No.	4		
	Gate (Sluice) valves				
N	40mm diameter screwed-in bonnet, full way rising stem, solid wedge disk, bronze gate valve to BS 5154 PN 20 for series "B" rating with wheel head and allow for jointing to uPVC tubing AS "CRANE" Model No. 151 or equal and approved	No	1		
O	65mm diameter ditto	No.	1		
TOTAL CARRIED FORWARD TO COLLECTION PAGE : M/S					

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				KSHS	KSHS.
	Pressure Gauges				
A	50mm dia., Range: 0 - 10 bars bourdon pressure dial gauge	No	1		
B	50mm dia., Range: - 0.5 - 5 bars bourdon pressure dial gauge	No	1		
	Non-Return (Check) valves				
C	65mm diameter Screwed-in cap, lift type metal disc bronze non-return valve to BS 5154 PN 32 for series "B" ratings. As "CRANE" Model No. D105 or equal and approved.	No.	2		
	Submersible Sump Pump				
D	submersible sump pump as "Pedrollo" Model No. Top 1 or equal and approved with a discharge of 1.39 l/s (5.0m ³ /hr) against a head of 3.0m with a power supply of of 0.37kW, 240V 50Hz.	No.	1		
	Electrical Works				
E	Allow for all electrical works including control panel wiring from the pumps to control panel, and local Isolator etc., Control panel to be complete with: - <ul style="list-style-type: none"> - Isolators - Contactors - Push Button switches for "ON" and "OFF" for pumps - "RED" pilot light for indicating control panel "LIVE" - "GREEN" pilot lights for indicating pumps "ON" - "RED" pilots lights for indicating pumps "TRIP or FAIL" - Labeling for each pilot light - Under Voltage protection - Make provision for the automatic running of the pumps in parallel, on call, in the control system by the provision of suitable inverters and circuitry. - All interconnecting wiring laid on cable trays and terminated/labelled to approval. 	Item	1		
TOTAL CARRIED FORWARD TO COLLECTION PAGE : M/S					

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				KSHS	KSHS.
	Pool Testing Kit				
A	Allow for a testing kit for: - - Residual Chlorine and PH - Alkalinity Control - Free Chlorine - Any other for satisfactory performance	Item	1		
	As installed drawings				
B	Allow for preparation of "As installed and record drawings"	Item	1		
	Testing and Commissioning				
C	Allow for setting to work, testing and commissioning	Item	1		
	Instruction Period				
D	Allow for instruction of the client staff on the operation and maintenance of the swimming pool equipment and initial maintenance during the liability defects period of 6 months.	Item	1		
	Special Maintenance tools				
E	Allow for the provision of any special maintenance tools to the client for the equipment and submit relevant list.	Item	1		
TOTAL CARRIED FORWARD TO COLLECTION PAGE:M/S					

ITEM	DESCRIPTION	AMOUNT
		KSHS.
	COLLECTION PAGE	
A	TOTAL CARRIED FROM PAGE No.F1/1	
B	TOTAL CARRIED FROM PAGE No. F1/2	
C	TOTAL CARRIED FROM PAGE No.F1/3	
D	TOTAL CARRIED FROM PAGE No. F1/4	
E	TOTAL CARRIED FROM PAGE No. F1/5	
	TOTAL CARRIED FORWARD TO FORM OF TENDER	

MECHANICAL WORKS SUMMARY PAGE

Item	Description	Total Cost (Kshs)
1.00	Plumbing, Drainage & Fire Fighting	
2.00	Borehole Drilling & Equiping	
3.00	Liquid Petroleum Gas	
4.00	Waste Water Treatment	
5.00	HVAC	
6.00	Irrigation	
7.00	Swimming Pool Equipment	
8.00	Allow PC sum of KES 10,000,000/= for Kitchen & Laundry Equipment	10,000,000.00
9.00	Allow PC sum of KES 8,000,000/= for Steam Bath, Jacuzzi & Sauna.	8,000,000.00
10.00	Allow a PC Sum of KES 5,000,000/- for Rainwater Harvesting	5,000,000.00
11.00	Allow a PC Sum of KES 10,000,000/- for Water Features Installations	10,000,000.00
Total Carried Forward to form Tender		

GRAND SUMMARY

Note:

1. The rates and prices shall be inclusive of VAT at 16%

**PROPOSED CENTRE FOR PARLIAMENTARY STUDIES AND TRAINING FOR PARLIAMENTARY SERVICE COMMISSION
GRAND SUMMARY**

ITEM	DESCRIPTION	UNIT	QTTY	AMOUNT(KSH) FOR CONTRACTOR'S USE	AMOUNT (KSH) FOR CONSULTANTS' USE
	SECTION NO. 28				
	GRAND SUMMARY PAGE				
	Total Brought Forward from Page No.		Page No.		
1.	PARTICULAR PRELIMINARIES		1/12		
2.	GENERAL PRELIMINARIES		2/17		
3.	MAIN BUILDING WORKS		15/1		
4.	CLUB HOUSE		16/1		
5.	GATE HOUSE: 2NO		17/38		
6.	SERVICE BUILDING		18/25		
7.	BOILER HOUSE		19/22		
8.	BOUNDARY WALL		20/10		
9.	CIVIL WORKS		21/29		
10.	LANDSCAPING		22/8		
11.	SIGNAGE AND ARTWORK		23/6		
12.	DAYWORKS AND SCHEDULE OF RATES		24/5		
13.	PRIME COST SUMS		25/1		
14.	ELECTRICAL INSTALLATIONS		SE / 1		
15.	MECHANICAL INSTALLATIONS		SM / 1		
	SUB - TOTAL 1				
16.	FLUCTUATIONS Add 2% of SUB-TOTAL 1		2.0%		
	SUB - TOTAL 2				
17.	CONTINGENCY Add 5% of SUB-TOTAL 2		5.0%		
	Carried to Form of Tender		Ksh		
	Section No. 28 GRAND SUMMARY				