DETAILED DESIGN AND SUPERVISION OF WORKS FOR THE BLUE SKILLS TRAINING FOR EMPLOYMENT PROJECT (B-STEP) FOR THE KISUMU NATIONAL POLYTECHNIC (TKNP)

AUDA-NEPAD/KfW 201569 052/FW1/KEN/005

SIFA Skills Initiative for Africa

AUDA-NEPAD AFRICAN UNION DEVELOPMENT AGENCY

SUBMITTED TO:

THE KISUMU NATIONAL POLYTECHNIC

P.O. BOX 143 KISUMU 40 100

SUBMITTED BY:

OTTO MRUTTU + PARTNERS ARCHITECTS

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Otto Mruttu + Partners Architects

DELIVERABLE 11B: DETAILED COST ESTIMATES AND BILL OF QUANTITIES REPORT

5TH SEPTEMBER 2026

Sample Bill of Quantities

A. Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions, Technical Specifications, and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices bid in the priced Bill of Quantities shall, except insofar 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.
4. 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.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill 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.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clauses 13.4 and 13.5 of the General Conditions except with respect to DAAB Fees and Expenses for which no instruction will be required from the Engineer.
8. 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].[1]

B. Work Items

1. The Bill of Quantities usually contains the following part Bills, which have been grouped according to the nature or timing of the work:

Bill No. 1—General Preliminaries;
Bill No. 2—Particular Preliminaries
Specifications;
Bill No. 3—Environmental, Social, Health & Safety activities;
Bill No. 4—Builders Works;

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[1] The method of measurement should be spelled out precisely in the Preamble to the Bill of Quantities, describing for example the allowances (if any) for timbering in excavation, etc. Many national standard reference guides have been prepared on the subject, and one such guide is the *Standard Method of Measurement* of the U.K. Institution of Civil Engineers.

Bill No. 5— External Works;
General Mechanical Specifications
Bill No. 6— Plumbing, Drainage, Air Conditioning & Firefighting;
Bill No. 7— Electrical Installation works & ICT installation Works;
Bill No. 8— Lift Installation;
Bill No. 9— Provisional Sums;

Daywork Schedule; and
Summary Bill of Quantities.

2.If BDS-ITB 15.1 applies, Bidders shall price the Bill of Quantities entirely in Euros (€) (referred to as the foreign currency)

Bill of Quantities

Bill No. 1: General Preliminaries

Part 2/1

	PART NO. 2	Shs.	Cts
	GENERAL PRELIMINARIES		
A.	PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES Wherever in the contractor's priced tender documents no price appears against an item of preliminaries or bill of quantities, the value of such item shall be deemed to be included in theirprices for the other items		
B.	ABBREVIATIONS Throughout these Bills, units of measurements and terms are abbreviated and shall be interpretedas follows:- 'm."- shall mean Linear Metre 'Lbs.'- shall mean Pounds Weight Avoidupois 'Kg.' - shall mean Kilogramme 'no.'- shall mean Number 'Prs.' - shall mean Pairs 'ms.' shall mean Measured Separately 'B.S.S.' shall mean the current British Standard Specifications published by the British StandardInstitution, 2 Park Street, London W.1, England 'Do.' Or 'Ditto' shall mean the whole of the preceding description except as qualified in the description in which it occurs. Where it occurs in descriptions of succeeding items, it shall meanthe same as in the first description concerned. Where it occurs in brackets, it shall mean the whole of the preceding description which is contained within the appropriate brackets. Where it is underline it shall mean the whole of that part or the preceding description which is underlined. 'As described' (a.d.) or 'as before described' (a.b.d.) shall mean as described in the Specificationor as described previously in a foregoing item or Bill.	NOTE	
B.	'Necessary, proper', etc. Wherever the words 'necessary, proper' or words of similar meanings are used in these Bills of Quantities with respect to the extent, conduct, character or work described, it is to be understood that they shall mean that the said work shall be executed to the extent, must be conducted in a manner or be of a character which is 'necessary' or 'proper' in the opinion of the Architect.		
	'Singular and Plural' Words importing the singular only wherever used hereinafter and in all Contract Documents shallalso include the plural and vice versa where the context required.		
	Carried to Part Summary		

		Shs.	Cts.
	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.) ABBREVIATIONS (Ctd.)		
A.	DEFINITION OF TERMS Employer The term 'The Employer' shall be deemed to mean **THE KISUMU NATIONAL POLYTECHNIC**, The term 'Employer', 'Client' and 'Owner' wherever used in this Tender Document shall be synonymous Architect The term "Architect" shall be deemed to mean the firm of **OTTO MRUTTU & PARTNERSARCHITECTS**, P.O. Box 76382-00508, Nairobi, Tel. Nos.+254722554624. E-Mail: ottomruttuarchitects@gmail.com Quantity Surveyor The term 'The Quantity Surveyor' shall be deemed to mean the firm of **NYANGE INTEGRATED CONSULTANTS**, Quantity Surveyors, P.O. Box 55425 - 00200, NAIROBI, Tel Nos. +254 797106126, E-Mail: info@nyange.co.ke / nrb@nyange.co.ke Engineer The term "Engineer" shall be deemed to mean any of the following firms appointed by the Employer to carry out the work under reference Structural/Civil Engineers **AMA CONSULTING ENGINEERS** P.O Box 66266 - 00800, NAIROBI Services Engineers **REX CONSULTANTS LIMITED** P.O. Box 73878 - 00200 NAIROBI		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
A.	DEFINITION OF TERMS (Ctd) Contractor The term "Contractor" shall mean the person or persons, partnership, firm or company, who's tender for this work has been accepted and who has or have signed this Contract and shall include his or their heirs, executors, administrators' assignees, successors and duly appointed representatives. Sub-Contractor The term "Sub-Contractor" shall be deemed to mean the person or persons, partnership, firm or company who has or have been engaged by the Contractor to carry out any Sub-Contract works forming part of this Contract and shall include his or their heirs, etc. as described above or who shall be appointed by the Employer to carry out the Sub-Contract Works.		
B.	FORM OF CONTRACT The Contractor will be required to enter into a Contract with the Employer on the latest Editionof the Agreement and Conditions of Contract for Building Works published by the Joint Building Council, Kenya. The clause headings of the above Conditions of Contract are given here below but for a complete description of the Clauses, tenders should refer to the above document, a copy of which is available for inspection at our offices during normal working hours or can be purchased from the offices of the Architectural Association of Kenya (AAK)		
C.	CONDITIONS OF CONTRACT The Tenderer's attention is called to the following Clauses of the Conditions of Contract which shall be read as incorporated herein and he shall allow any sums which he considers necessary forthe carrying out and observance of such Conditions: Clause 1 Definitions Clause 2 Articles of Agreement Sub-Clause 2.6 shall be deleted Sub-Clause 2.9 shall be deleted Sub-Clause 2.12 shall be deleted Sub-Clause 2.13 : The delegated authority of such Engineers, specialists and other consultants shall be limited to those described in the preliminaries section of the contract bills **Note:** The Contractor shall allow for paying all legally demandable fees,rates or taxes including V.A.T., and those for hoarding and temporary buildings, and no adjustment of the Contract Sum will be made in respect of such payments unless expressly stated to the contrary in these Bills of Quantities.	**NOTE**: Also see item B on page 3/8	
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
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B.	FORM OF CONTRACT The Contractor will be required to enter into a Contract with the Employer on the latest Edition of the Agreement and Conditions of Contract for Building Works published by the Joint Building Council, Kenya. The clause headings of the above Conditions of Contract are given here below but for a complete description of the Clauses, tenders should refer to the above document, a copy of which is available for inspection at our offices during normal working hours or can be purchased from the offices of the Architectural Association of Kenya (AAK)		
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	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
C.	CONDITIONS OF CONTRACT (Ctd)		
	Clause 12 Insurance against Injury to Persons and Property **Note:** the Contractor shall effect and maintain the following insurances in the joint names of the Employer and Contractor with an insurance firm to the approval of the Employer and Architect to cover the full value of the following insurances as required by Clause 13 and shall allow for all costs thereof: - a)Employer's Liability (Workmen's Compensation) b)Third Party (Public) Liability for an Indemnity of not less than **Kenya Shillings Five Million** (**KShs. 5,000,000.00)** in any one accident or series of accidents arising from the same event (unlimited in aggregate) Should the Contractor already hold annual insurance covering the whole of his activities and the indemnity required under this Contract exceeds the indemnity under the existing policy (ies), then further insurances shall be effected and maintained to cover such excess. The Contractor shall ensure that all Sub-Contractors effect and maintain such insurances as are necessary to cover their liabilities in respect of injury to persons and property and Workmen's Compensation.		
	Clause 13 Insurance of the Works (Contractors Liability)		
	Clause 14 Insurance of the Works (Employer's Liability) **Note:** This Clause is deleted		
	Clause 15 Insurance of the Works (works of Alterations etc) **Note:** This Clause is deleted		
	NOTES ON INSURANCE In addition to the Conditions of Contract and the requirements containedin the foregoing Clauses, the Contractor/Employer shall include in the insurance policies described above full Indemnity for the following items and shall allow for all costs thereof: - a)The Contract Works and temporary works to be erected in performance of this Contract to the value of not less than the ContractSum. b)The Materials on Site. c)The Contractor's plant, tools and equipment	NOTE Also see item B on page 2/23	
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
C.	CONDITIONS OF CONTRACT (Ctd)		
	d)Escalation/inflation on (b) above for an Indemnity of not less than15% of the Contract Sum		
	e)Spare parts, fuel, stores, provisions and property of employees (Note: This item to be at the discretion of the Contractor)		
	Full Indemnity shall also be taken out in the same Policy to include and Indemnify the following SPECIAL CLAUSES: - g) Automatic reinstatement of loss h) Damage to any existing property j) The Maintenance period of Six (6) Months k) The Fluctuation Clause l) All site Sub-Contractors m) All cross liabilities n) The Principals Clause		
	Any EXCESS cover required shall be at the sole discretion of the Contractor or example for any or all of the following; Storm, flood, subsidence, collapse, etc. Plant and equipment claims Third party claims Goods in transit claims or any other Claim		
	Clause 16 Performance Bond Clause 16.1 – The Contractor shall either allow for a Cash Bond or obtain and submit on the Letter of bid the name of one Surety who shall be an established bank or insurance Company or fidelity guarantee company and who are willing to be bound to the Employer in an amount equal to Ten Percent (10%) of the Contract amount for the due performance 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 annexed in the Form of Agreement (Without the addition of any limitations) on the same day as the Contract Agreement is signed. In the event of the Surety named in the Letter of bid not being approved by the Employer, the Contractor shall furnish within **seven (7) days** another Surety to the approval of the Employer	**NOTE**	
	Clause 16.2 – Employer's Performance Bond (Not Applicable - to be deleted)	**NOTE**	
	Clause 17 Compliance with regulations, notices etc.		
	Clause 18 Programme of works The contraction is expected to work during normal hours		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
C.	CONDITIONS OF CONTRACT (Ctd.)		

Clause 19 Access to the works.

The contractor shall provide to the Employer and his representative's access to the works and workshops or other places of the Contractor wherework is being prepared for the Contract. This shall be in addition to similar access to be provided to the Architect and his representatives.

Clause 20 Possession of site and commencement of works

Clause21 Leveling and setting out
Sub-Clause 21.1 Amend "The Employer to The Architect"

Clause 22 Architect's instructions

Clause 23 Specification of goods, materials and workmanship

Note: All materials, goods and workmanship shall be strictly in accordance with these Bills of Quantities and the Contractor's prices must include for all expenses involved in carrying out the works strictly in accordance herewith.

Clause 23.3 shall only apply where the materials are available in the market at the time of the tender but are subsequently withdrawn from the market at the time the Contract is executed.

Clause 24 Samples and tests

Clause 25 Royalties and patent rights

Clause 26 Assignment

Clause 27 Subletting

Clause 28 Suspension of works by the Architect

Clause 29 Suspension of the works by the Contractor

Clause 30 Variations

Note: the Contractor shall submit to the Architect claims for any work or circumstance on account of which he may consider that he is entitled to extra payment within seven days from the time of commencement of such work or occurrence of such circumstance. Any such claim must be in writing and accompanied by full particulars and must state under which provision of the Contract it is claimed that payment shall be made.

Carried to Part Summary

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
C.	CONDITIONS OF CONTRACT (Ctd)		
	Daywork Rates Any Daywork ordered under Sub-Clause (4)(C) of this Clause shall be the Prime Cost to which the following percentages will be added as appropriate Labour .....% Materials..... % Plant .....% The percentage additions shall cover all other on-costs associated with the Execution of the day works including Contractor's establishment and overheadcosts and profit. The Prime Cost shall in each case be calculated on the basis of market prices prevailing as at the date of execution of the day work and shall be determined by the Quantity Surveyor. Day work will be allowed only where specifically ordered or authorized by the Architect or their authorized representative in writing. All day work sheets must be signed by both the Architect and the Contractor or their authorized representatives. **Final Account** The Contractor shall be required to prepare and submit to the Quantity Surveyor for their agreement, detailed Bills of Quantities for all variation works requiring re-measurement and works covered by Provisional Sums as soon as such works are completed and the Tenderer should allow for all costsinvolved in complying with this requirement. The agreed Bills will form the basis of the Final Account. Carried to Part Summary	NOTE: Tenderer to insert percentages NOTE Also see ClauseC on page 3/18 IMPORTANT NOTE	

	PART NO. 2 (Ctd.)	Shs.	Cts.
	GENERAL PRELIMINARIES (Ctd)		
C.	CONDITIONS OF CONTRACT (Ctd)		
	Clause 31 Nominated Sub-Contractors		
	Note: The Contractor must enter into Sub-Contracts with the NominatedSub-Contractors on the latest edition of the Standard 'Agreement and Schedule of Conditions of Building Sub-Contract' form published by the Kenya Association of Building and Civil Engineering Contractors. He must incorporate therein any conditions herein applicable to Nominated Sub- contractors and if he fails to do so must accept full responsibility for any omissions, delays, bad workmanship, claims or expenses arising from the absence thereof. The Sub-Contract must cover such matters as payments on account, retention sums, maintenance period, facilities, dates for completion of each portion of the works together with a liquidated and ascertained damages clause in the event of delayed completion or non-completion and indemnity of the Contractor against any claims arising out of the misuse by any such Sub-Contractor or his workmen of any scaffold erected or plant employed by the Contractor, or that may be made against the Contractor in consequence of any act, omission or default of the Sub-Contractor, his servants or agents, or in respect of injury to workmen employed by the Sub- Contractor	Also see item D on page 2/21 & item B on page 3/16	
	IMPORTANT NOTE Notwithstanding the provisions contained in Clauses 31, the Employer reserves the right to incorporate work of any Nominated Sub-Contractor into the Main Contract in which event the Nominated Sub-Contractor shall become a domestic Sub-Contractor to the Main Contractor for all intents and purposes of this Contract. Any rights and obligations of the Nominated Sub- Contractor under Clause 31 will in that event revert to the Main Contractor. No claims will be entertained from the Main Contractor if the Employer decides to exercise this right but profit, overheads and attendance on the appropriate P.C. Sums will be paid as provided for in the Contract.		
	Carried to Part Summary		

PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd)	Shs.	Cts.
Clause 32 Nominated Suppliers **Note:** With regard to Nominated Sub-Contractors and Suppliers: -	Also see Item B on page 2/22 & item B on page 3/19	
a)The Contractor will not receive any cash, trade or other discounts on Prime Cost and Provisional Sums. Any profit in lieu of these discounts which the Contractor desires must be priced by him against the appropriate items provided in the Bills of Quantities. b)When tendering for works covered by Prime Cost and Provisional Sums, the Contractor will be treated as any other Nominated Supplier or Sub-Contractor. c)The Employer reserves the right to pay direct on certificates of the Architect some or all accounts in respect of works and Provisional Sums due to Nominated Sub-Contractors or Nominated Suppliers and to deduct any amounts so paid from any sums otherwise payable to the Contractor. Should this reservation be adopted, any profits which the Contractor may have allowed on Prime Cost and Provisional Sums may be omitted from the Contract, at the discretion of the Architect. Direct payment will not be deemed to construe omission of the work from the Contract and the Contractor will continue to be responsible for the work or goods in accordance with the terms of the Contract. Clause 33 Works by other persons engaged by the Employer Clause 34 Payments **NOTES:** a)At intervals stated, Certificates shall be issued subject to Sub-Clause 34.4. When applying for a Certificate, the Contractor shall furnish the Quantity Surveyor with a detailed approximate statement of the value of work executed and all materials on site in order to expedite the issue of the Certificates. b)Subsequent Certificates will not be issued to the Contractor by the Architect until satisfactory proof has been given by the Contractor that Nominated Sub-Contractors and Suppliers have been paid the amounts included for them in previous Certificates issued to the Contractor. c)All documents necessary for the purpose of the composition of the Final Account including all documents relating to the Accounts of Nominated Sub- Contractors and suppliers shall be passed to the Quantity Surveyor as and when available during the progress of the works and not later than one month after Date of Practical Completion		
Carried to Part Summary		

	PART NO. 2 (Ctd.)	Shs.	Cts.
	GENERAL PRELIMINARIES (Ctd)		
C.	CONDITIONS OF CONTRACT (Ctd)		
	d)The whole of Sub-Clauses 34.14 and 34.15 shall be deleted		
	c)All documents necessary for the purpose of the composition of the Final Account including all documents relating to the Accounts of Nominated Sub-Contractors and suppliers shall be passed to the Quantity Surveyor as and when available during the progress of the works and not later than one month after Date of Practical Completion		
	d)The whole of Sub-Clauses 34.14 and 34.15 shall be deleted	IMPORTANT	
	Clause 35 Fluctuations **Note**: Delete the whole of this clause This is a fixed rate Contract and the Contractor must allow in his tender for any increase in the cost of labour, materials and plant for any reason whatsoever during the currency of the Contract.	NOTES Also see item Don page 3/5	
	Clause 36 Extension of time **NOTE** Sub clause 36.1.2 to be amended as follows: "by reason of any exceptionally adverse weather conditions taking into considerations the worst weather conditions recorded in the past Ten (10) years by the Meteorological Department"		
	Clause 37 Loss and expense caused by disturbance of regular progress of the works		
	Clause 38 Termination of the Contract by Employer		
	Clause 39 Termination of the Contract by the Contractor		
	Clause 40 Termination of the Contract by either party		
	Clause 41 Practical completion and defects liability	Also see item A on page 3/19	
	Clause 42 Sectional completion	Also see Item C on page 3/6	
	Clause 43 Damages for delay in completion		
	Clause 44 Antiquities and other objects of value		
	Clause 45 Settlement of disputes		
	Carried to Part Summary		

		Shs.	Cts.
	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.) CONDITIONS OF CONTRACT (Ctd.) **NOTE: Particulars of the insertions to be made in the Appendix to the ContractAgreement will be found on Page 3⁄6 of the Particular Preliminaries of these Bills.**		
A.	PROVISIONAL WORKS All work described as "Provisional" in these Bills of Quantities is subject to re-measurement inorder to ascertain the quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract shall be left uncovered for a reasonable time to allow all measurements needed for such adjustments to be taken by the Quantity Surveyor. Immediately the work is ready for measurement the Contractor shall give notice to the Quantity Surveyor. If the Contractor makes default in these respects, he shall, if the Quantity Surveyor so directs, uncover the work to enable measurements to be taken and afterwards reinstate at his ownexpense.	IMPORTANTNOTE	
B.	MATERIALS AND WORKMANSHIP All materials shall be new unless otherwise directed or permitted by the Architect and in all cases where the quality of goods or materials is not described or otherwise specified are to be the best quality obtainable in the ordinary meaning of the word "best" and not merely a trade significationof that word. All materials shall also be to the approval of the Architect. The Contractor shall order all materials required 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 such materials are on site when required for use in the works. The Contractor shall be responsible for and shall replace or make good at his own expense anymaterials lost or damaged. Skilled workmen well versed in their respective field shall execute the Works throughout. The successful Tenderer shall be deemed to have investigated the practicability of using locally available materials in the various components of the building and shall be deemed to have priced accordingly. No claims shall be entertained thereafter for want of knowledge in this respect.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd).	Shs.	Cts.
A.	REJECTED WORKMANSHIP OR MATERIALS Any workmanship or materials not complying with the specific requirements or approved samples or which have been damaged, contaminated or have deteriorated, must be immediately removed from the site and replaced at the Contractor's expense, when required and so instructed by the Architect.		
B.	SUFFICIENCY OF TENDER The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his Tender for the works and of the rates and prices stated in the priced Bills which rates and prices shall cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.		
C.	STAMP DUTY CHARGES The Contractor shall allow for the payment of all stamp duty charges in connection with the Performance Bond and Contract Agreement.		
D.	PROGRAMME AND PROGRESS SCHEDULE Immediately upon acceptance of their tender and not later than Two weeks, the Main Contractor shall be required to prepare a computer generated programme and progress schedule clearly indicating the critical activities and setting out the appropriate dates thereof including the work of Nominated Sub-Contractors. This Programme and Progress Schedule is to be submitted to the Architect and Consultants for their approval. No deviation from the order set out in this Schedule will be permitted without the written consent of the Architect. The Main Contractor will be responsible for arranging the above Programme with all Sub-Contractors and Nominated Suppliers.	IMPORTANT NOTE	
	Carried to Part Summary		

	PART NO. 2 (Ctd.)	Shs.	Cts.
	GENERAL PRELIMINARIES (Ctd).		
A.	PROGRAMME AND PROGRESS SCHEDULE (Ctd). No Payment Certificate shall be issued by the Architect until the Schedule has been submittedand approved. One copy of the Schedule is to be handed to the Architect and a further copy to be retained onsite on which progress shall be recorded at regular agreed intervals by the Contractor and produced in upto date form at all site meetings. Should any circumstances arise affecting the Schedule, the chart shall be amended or modified asnecessary by agreement with the Architect and all parties shall be informed.	IMPORTANT NOTE	
B.	FIGURED DIMENSIONS Figured dimensions are to be followed in preference to dimensions scaled from the drawings butwhenever possible dimensions are to be taken on the site or from the buildings. Before any workis commenced by Sub-Contractors or Specialist Firms, dimensions must be checked on the site and/or buildings and agreed with the Contractor, irrespective of the comparable responsibility for the accuracy of such dimensions.		
C.	PROPRIETARY MATERIALS Where proprietary materials are specified in the Specifications, the Contractor may propose the use of equivalent materials from other manufacturers but of equal quality for approval by the Architect. All materials and goods, where specified to be obtained from a particular manufacturer or supplier are to be used or fixed strictly in accordance with their instructions.		
D.	PLANT, TOOLS AND SCAFFOLDING The Contractor shall provide all necessary hoists, tackle, plant, vehicles, tools and appliances of every description for the due and satisfactory completion of the works and shall remove the same on completion and provide, erect and maintain all temporary scaffolding, sufficiently strong and efficient for the due performance of the Works including Sub-Contractor's works, provide specialscaffolding 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. 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 altered and adapted during the Contract as may be necessary to comply with any amendments in or additions to such regulations. **NOTE: Scaffolding is not measured hereinafter and the Contractor must allow herein hisTender for the above.** No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.	Also see item A on page 3/16	
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd).	Shs.	Cts.
A.	SIGN FOR MATERIALS SUPPLIED The Contractor will be required to sign a receipt for all articles and materials 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, damage, storage, insurance, protection and handling. Any replacement will be at the Contractor's own cost and expense at current market prices including Customs Duty, V.A.T. and all other related charges to the satisfaction ofthe Architect.		
B.	STORAGE OF MATERIALS The Contractor shall provide at his own risk and cost where directed on or off the site weather- proof lockup sheds for the safe storage and custody of materials for the works and for the use of workmen engaged thereon and shall remove such sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the Architect. The Contractor shall also provide a separate weather-proof lock-up store for the safe storage ofmaterials supplied by the Employer.	NOTE	
C.	SAMPLES The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete tests cubes required for the works that may be called for by the Architect for his approval or rejection until such samples are approved by the Architect and the Architect may reject any materials or workmanship which in his opinion is not up to the required standards and specifications. The procedure for submitting samples of materials for testing and the method of marking foridentification shall be as laid down by the Architect. The Contractor shall allow in his Tender for the provision of all such samples except those inconnection with Nominated Sub-Contractor's work.		
D.	TESTING 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. Allow for all expenses in connection with testing of materials as specified hereunder includingthe 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 theArchitect and carried out but unsuccessful tests will not be included in the measurement.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
D.	TESTING (Ctd.)		

TYPE OF TEST	QUANTITY	PROVISIONAL RATE
Water Test (1 Litre)	5 No.	
Sand Test (0.1 cubic metre)	8 No.	
Aggregate Test (0.1 cubic metre)	10 No.	
Reinforcement Test (I linear Metre mild steel rod or high tensile steel bar of various diameter from 6mm to 25mm)	15 No.	
Concrete Test (Each test comprising four standard cubes)	100 No.	
Natural Stone (Blocks)	12 No.	
Concrete Blocks testing of various strengths in accordance with British standard specifications (One test comprises ten blocks)	18 No.	

The Contractor shall allow for other testing of materials apart from the above required by these Specifications and he shall be responsible for all expenses incurred in completing such tests, including costs of labour, materials, equipment, transport and charges of the testing authority, etc.

A. SUPERVISION AND WORKING HOURS

The works shall be executed under the direction and to the entire satisfaction in all respects of the Architect 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.

The working hours shall be those generally worked by good employers in the Building and Civil Engineering Trades in the Republic of Kenya.

NOTE

No work shall be carried out at night or on gazetted holidays unless the Architect shall so direct. Supervision shall only be carried out at night on Saturdays/Sundays or on Public Holidays with adequate advance notice and prior arrangement with the relevant Consultant or the Clerk of Works.

No work shall be so covered up nor shall any concreting be carried out in the absence of the Clerk of Works without the prior approval of the Architect in writing.

B. SITE MEETINGS

Site Meetings will be held in the site offices at intervals as directed by the Architect and the Contractor will be required to attend and also summon the attendance of Sub-Contractors and Specialists. Adequate arrangements must be allowed for with regard to tables, chairs, etc which must be provided by the Contractor.

Carried to Part Summary

	PART NO. 2 (Ctd.)	Shs.	Cts.
	GENERAL PRELIMINARIES (Ctd.)		
A.	SITE DIARY		
	A site diary shall be provided by the Contractor in the form of a double foolscap size stiff covered ruled book which should be kept available at all times upon the site. Entries made in the site diary by the Architect or his duly appointed representative shall be deemed to be the Architect's instructions given in writing and the Contractor shall confirm the same to the Architect within **Seven (7) clear working days**.		
	All persons entering the site or other working area on whatever business shall be instructed bythe Contractor to record their visit in the site diary giving their name, address and reason for visiting the site.	Also see item B on page 3/8	
B.	EXISTING SERVICES		
	Prior to commencement of any work, the Contractor is to ascertain from the Client and relevant Authorities the exact position, depth and level of all existing electric cables, water pipes or other services in the area and he shall make whatever provisions may be required by the Client and Authorities concerned for the support and protection of such services. Any damage or disturbance caused to any service shall be reported immediately to the Employer and the relevant Authority and shall be made good to the satisfaction of the Architect and the Contractor's expense.	NOTE	
	The contractor will similarly maintain on a 24hour basis a qualified electrician and plumber toensure the critical services to the building are not interrupted.		
C.	GOVERNMENT ACTS REGARDING WORKFORCE, ETC.		
	Allow for complying with all Government Acts, Orders and Regulations in connection with the Employment of Labour and other matters related to the execution of the works. The tender price must include for all costs arising or resulting from compliance with any Act, Order or Regulation relating to Insurances, Pensions and Holidays for workpeople or to the safety, health or welfareof workpeople.		
	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. 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.	NOTE	
	No claim in respect of want of knowledge in this connection will be entertained.		
D.	SECURITY OF WORKS, ETC.		
	The Contractor shall be entirely responsible for the security of all the works, stores, materials, plant, personnel, etc both his own and Sub-Contractor's and must provide all necessary watching,lighting and other precautions as necessary to ensure security against theft, loss or damage and the protection of the public.		
	Maximum precautions must be exercised to uphold security in the vicinity of the Works.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
A.	TRANSPORT TO AND FROM THE SITE The Contractor shall include in his prices for the transport of materials, workmen, etc to andfrom the site of the proposed Works, at such hours and by such routes as are permitted by the competent Authorities.		
B.	PUBLIC AND PRIVATE ROADS AND PAVEMENT The Contractor will be required throughout the execution of the Works to maintain and make good at his own expense any damage he may cause to the present public and private road surfaces and pavements arising from or consequent upon the execution of the works, to the satisfaction of the Local or other Authority and the Architect.		
C.	WORKS AND SITE TO BE DELIVERED UP CLEAN The Contractor shall upon completion of the Works, at his own expense, remove and clear away all surplus excavated material, scaffolding, plant, rubbish and unused material and shall leave the whole of the site and Works in a clean and tidy state to the satisfaction of the Employer, including clearing away and making good all traces of temporary access roads, offices, sheds, camps, etc. Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all sanitary fittings, glass inside and outside and any other parts of the works which may require it; remove all marks, blemishes, stains and defectsfrom joinery fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupationto the approval of the Architect. Particular care shall be taken to leave all floors and windows clean and to remove all paint and cement stains. He shall also at the discretion of the Employer remove all rubbish and dirt as it accumulates.		
D.	OCCUPATION CERTIFICATE At the completion of the Works, the Contractor shall apply for and obtain the Occupation Certificate from the Local Authority and see that it is duly completed and signed in accordance with conditions laid down by current By-Laws.		
E.	DISTURBANCE OR NUISANCE The Contractor shall allow for taking all necessary precautions in the order and execution of the Works so as to avoid causing disturbance or nuisance to the occupants of any existing buildingon or adjacent to the Works and to the public and for complying with the Architect's instructions in this respect.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
A.	EXISTING PROPERTY The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services and he will be held responsible for and shall make goodall such damage arising from the execution of this Contract at his own expense to the satisfaction of the Architect.	NOTE	
B.	TRESPASS, DAMAGE AND CARE OF WORKS The Contractor shall prevent any trespass on the adjoining property and he shall take all reasonable precautions during the progress of the Contract to prevent any damage to the adjoining property or public or private roadways and to prevent material, plant, rubbish, debris, etc collecting on the adjoining property or roadways. Should the Contractor wish to erect scaffolding on or to make use of adjoining property he shall obtain prior permission from the Architect and clear away at completion of his work or when directed and make good any damage to his satisfaction. Except as provided for in the Conditions of Contract, the Contractor shall be held responsible for the care of Works generally until their completion, including all works executed and materials deposited on the site by himself or Sub-Contractors or suppliers, together with all risks arising from weather, carelessness of operatives, damage or loss at his own expense. The Contractor will be responsible for the protection of adjoining buildings, bouequence of any act, omission or default of the Sub-Contractor, his servants or agents, or in respect of injury to workmen employed by the Sub-Contractor The Contractor shall allow for making good all damage to the roads, kerbs, surface water channels, materials and building operations generally to the entire satisfaction of the Architect and shall be responsible for observing any By-Law or Authority regarding keeping the road free from mud, filth, etc arising out of the execution of the Works. The Contractor shall at all times observe any police regulations including those regarding the loading and unloading of or waiting by vehicles on the pubic highway and the Contract Sum shallbe deemed to include for strict compliance therewith.		
C.	VISIT SITE AND EXAMINE DRAWINGS The Contractor is recommended to examine the drawings and visit the site, the location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted himselftherewith as to its nature, position, means of access or any other matter which may affect his Tender. No claims arising from his failure to comply with this recommendation will be considered.		
D.	ACCESS TO SITE AND TEMPORARY ROADS Means of access to the site shall be agreed with the Architect prior to commencement of thework and the Contractor must allow for building any necessary temporary access roads for the transport of the materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, bridges or any other means of gaining access to the site.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
	Upon completion of the Works, the Contractor shall remove such temporary access road, temporary culverts, bridges, etc and make good and reinstate all work and surfaces disturbed to the satisfaction of the Architect.		
A.	AREA TO BE OCCUPIED BY THE CONTRACTOR		
	The area of the site which may be occupied by the Contractor for use of storage and for thepurpose of erecting workshops, etc shall be defined on the site by the Architect.		
B.	OFFICE, ETC. FOR THE CONSULTANTS		
	The Contractor shall provide, erect and maintain where directed on site and afterwards dismantleSite Offices of the type noted in the Particular Preliminaries complete with furniture.	NOTE	
	He shall also provide a strong metal trunk complete with strong hasp and staple fastening andtwo keys.	Also see item A page 3/10	
	The Contractor shall further make available on the Site as and when required for use by any Consultant or Clerk of Works the following which should be maintained in good working condition at all times: -	IMPORTANTNOTE	
	1. One dumpy or quick set level and levelling staff		
	2. One 30 metre steel tape		
	3. Micrometer screw gauge		
	4. Straight edges 3.0m and 1.0m long for testing accuracy of the finished concrete		
	5. A glass graduated cylinder for use in the silt test for Organic Impurities in the sand		
	6. Slump test apparatus		
	7. 12 Nos. standard cube moulds		
	8. Plumb Bob		
C.	WATER AND ELECTRICITY SUPPLY FOR THE WORKS		
	Unless otherwise stated in the Particular Preliminaries hereof, the following requirements shallapply: -	NOTE	
	The Contractor shall provide at his own risk and cost all necessary water, electric light and powerrequired for use in the Works. No guarantee is given or implied that mains power will always be available and the Contractor shall make his own arrangements for providing temporary power.		
	The Contractor must make his own arrangements for connection to the nearest suitable watermain and for metering the water used.		
	He must also provide temporary storage tanks and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the Architect. The Contractor shall pay all charges in connection therewith.		
	No guarantee is given or implied that sufficient water will be available from the mains and the Contractor must make his own arrangements for augmenting this supply at his own cost if necessary.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
A.	SANITATION OF THE WORKS The sanitation of the works shall be arranged and maintained by the Contractor to thesatisfaction of the Local Authorities, Labour Department and the Architect.		
B.	PROVISIONAL SUMS The term 'Provisional Sums" 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 ConditionNo. 8 on Page 2/4 hereof. Such sums are net and no addition shall be made to them for profit		
C.	PRIME COST (OR P.C.) SUMS 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. 8 on Page 2/4 hereof. Persons or firms nominated by the Architect to execute work or to provide and fix materials or goods as stated in Condition No. 31 of the Conditions of Contract are descried herein as **Nominated Sub-Contractors.** Persons or firms so nominated to supply goods or materials are described herein as **Nominated Suppliers.**		
D.	ADJUSTMENT OF P.C. SUMS In the Final Account, all P.C. Sums shall be deducted and the amount properly expended upon the Architect's order in respect of each of them added to the Contract Sum. The Contractor shall produce to the Architect such quotations, invoices or bills properly receipted as may be necessaryto show the actual details of the Sums paid by the Contractor. Items of profit on P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" 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 Bills shows a percentage in the rate column in respect of them Should the Contractor be permitted to Tender and his Tender be accepted for any work forwhich a P.C. Sum is included in these Bills of Quantities, profit and attendance will be allowed atthe same rate as it would be if the works were executed by a Nominated Sub-Contractor.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.)	Shs.	Cts.
	GENERAL PRELIMINARIES (Ctd.)		
A.	ADJUSTMENT OF PROVISIONAL SUMS		
	In the Final Account, all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the Architect's order added to the Contract Sum. Such work shall be valued as described for Variation under Condition No. 30 of the Conditions of Contract, but should any part of the work be executed by a Nominated Sub-Contractor or any articles forthe work supplied by a Nominated Supplier, the value of such work or article 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.		
B.	NOMINATED SUB-CONTRACTORS AND SUPPLIERS		
	When any work is ordered by the Architect to be executed by Nominated Sub-Contractors, the Contractor shall enter into Sub-Contracts as described in Condition No. 31 of the Conditions of Contract and shall thereafter be responsible for such Sub-Contractors in every respect. In particular, it shall be the Contractor's responsibility to ensure that each Sub-Contractor commences and completes the work in such manner and is ready on the site with his materials, labour and special plant at such time so as to conform with the Works Programme.	Also see clauses31 & 32 on pages 2/9 & 2/10	
	Before placing any orders with Nominated Sub-Contractors or Nominated Suppliers, the Contractor must ascertain that the terms and Conditions of the quotations and the date of delivery of materials or execution of work comply with the terms of the Contract and the Works Programme.		
	The cost of taking delivery and fixing only materials including those to be obtained from Nominated Suppliers which are covered by Prime Cost or Provisional Sums shall include for taking delivery where directed, checking with invoices or indents, reporting and claiming damagesfor shortages and damaged goods, defraying demurrage, signing for as having been received in good order, loading, handling, transporting to site, unloading, insuring, storing, covering and protecting until the time of fixing, unpacking, replacing anything lost or damaged, sorting, assembling, hoisting, distributing or conveying to required levels or positions, cutting, wastage and fixing as described.	NOTE	
	Unless otherwise described, the Contractor is to provide for such Sub-Contractors any or all ofthe above facilities.		
C.	ATTENDANCE UPON NOMINATED SUB-CONTRACTORS		
	The term "attendance" following P.C. Sums for Nominated Sub-Contracts' work in these Bills of Quantities shall be deemed to include both attendance and items of special attendance as defined in Item D on Page 2/23		
D.	DIRECT CONTRACTS		
	Notwithstanding the foregoing Conditions, the Employer 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 such instance, profit relative to the P.C. Sum in the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
A.	MATERIALS ARISING FROM EXCAVATIONS Materials of any kind obtained from the excavations shall be the property of the Employer. Unless the Architect 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 written permission of the Architect. 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.		
B.	PROTECTION OF THE WORKS Provide protection of the whole of the works contained in the Bills of Quantities including casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the Architect and remove such protection when no longer required and make good any damagewhich may nevertheless have been done at completion free of costs to the Employer.		
C.	REMOVAL OF RUBBISH, ETC. Remove all rubbish and debris from the building and site as it accumulates and at completion ofthe works and remove all plant, scaffolding and unused materials at completion.		
D.	STATUTORY LEVIES The Tender must include for all costs arising or resulting from any Law requiring payment by theContractor of any Statutory Levy or Levies currently in force.		
E.	MATERIALS ON SITE All materials for incorporation in the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the Architect. This is to include the materialsof Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.		
F.	GENERAL SPECIFICATION For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Specifications contained in Part No. 4 herein which shall be followed in all respects unless it conflicts with the General Preliminaries, ParticularPreliminaries or other items in these Bills of Quantities, in which case the contents of the Bills of Quantities shall apply.		
	Carried to Part Summary		

	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.)	Shs.	Cts.
A.	EXCEPTIONS TO THE STANDARD METHOD OF MEASUREMENT The exceptions to the Standard Method of Measurement for Building Works are as follows :-		
B.	ATTENDANCE Clause B19(b) of the Standard Method of Measurement is deleted and the following Clause issubstituted: "Attendance on Nominated Sub-Contractors shall be given as an item in each case and shall be deemed to include allowing use of standing scaffolding; providing retaining, maintaining, alteringand later removing all special scaffolding; allowing the use of messrooms, sanitary accommodation and welfare facilities; providing office and storage facilities and water and power (all as specified in the Preliminaries, unloading, handling, storing, hoisting, placing in position, providing watching and lighting; hacking surfaces as required, clearing away rubbish, removing and replacing dust covers, pipe casting and the like necessary for the execution and testing of Sub-Contractors' works; providing templates, dimensions and supervision for the proper carrying out of the Sub-Contractors' work and being responsible for the accuracy of the same".		
C.	BUILDER'S WORK Clause B19(c) of the Standard Method of Measurement is deleted and the following Clausesubstituted: "All builder's work in connection with work by Nominated Sub-Contractors including cutting all holes, chases, sinking and pockets and making good all floor, wall and ceiling finishes shall be given as an item".		
D.	DISPOSAL OF WATER Clause D18 (a) and (b) of the Standard Method of Measurement are deleted and the followingClause is substituted: "Keeping excavations free from all water **including** spring and running water shall be given as anitem or shall be included in the description of excavation"	IMPORTANT NOTE	
	Carried to Part Summary		

		Shs.	Cts.
	PART NO. 2 (Ctd.) GENERAL PRELIMINARIES (Ctd.) PART SUMMARY Brought Forward From Page No. 2/1 .. .. " " " Page No. 2/2 .. .. " " " Page No. 2/3 .. .. " " " Page No. 2/4 .. .. " " " Page No. 2/5 .. .. " " " Page No. 2/6 .. .. " " " Page No. 2/7 .. .. " " " Page No. 2/8 .. .. " " " Page No. 2/9 .. .. " " " Page No. 2/10 .. .. " " " Page No. 2/11 .. .. " " " Page No. 2/12 .. .. " " " Page No. 2/13 .. .. " " " Page No. 2/14 .. .. " " " Page No. 2/15 .. .. " " " Page No. 2/16 .. .. " " " Page No. 2/17 .. .. " " " Page No. 2/18 .. .. " " " Page No. 2/19 .. .. " " " Page No. 2/20 .. .. " " " Page No. 2/21 .. .. " " " Page No. 2/22 .. .. " " " Page No. 2/23 .. .. " " " Page No. 2/25 .. .. **TOTAL AMOUNT OF PART NO. 2 GENERAL PRELIMINARIES** Carried to Main Summary **Shs.**		

Bill No. 2: Particular Preliminaries

Part 3/1

	PART NO. 3	Shs	Cts.
	PARTICULAR PRELIMINARIES		
A.	SPECIFICATIONS		
	The Contract works shall be carried out in accordance with the Specifications contained in Part No. 4 of this document, the drawings listed in the Schedule of Drawings on Pages 1/8 herein together with any further drawings that may be issued in amplification thereof.		
B.	BRIEF DESCRIPTION OF THE WORKS		
	The works to be executed under this contract comprise of erection and completion of Blue Skills Training and Employment Centre. The structure consist of the following;		
	Aqua center which consists of laboratories, shops, processing room, hatchery room, grow out room, harvesting room, offices, and separate ladies and gents washrooms		
	Restaurant which contains an outdoor and indoor dining area, kitchen battery/ inventor room and separate ladies and gents washrooms		
	Teaching building consists of an entrance lobby, lecture hall, computer laboratory and separate ladies and gents washrooms on the ground floor and classrooms, stores, control room and separate ladies and gents washrooms on the first floor		
	Administration building consists of an entrance lobby and reception, executive offices and conference room, offices, open plan workspace, battery room, staff lounge and separate ladies and gents washrooms		
	Visitors Museum consists of an entrance lobby, permanent exhibitions, archives, server room, curator's office and an immersive exhibition		
	The Roof consist of concealed interlocking roof sheeting on a steel truss roof structure.		
	External works include a power room, refuse room, gate house, workshops, carparking spaces, wild fish pond,		
	Mechanical works and Electrical works will be executed by approved sub-contracts		
	The actual works include the following		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
	Building Works A. Excavation and earthworks up to approximately 1.5 metres deep from existing ground level. The structure shall be founded on either soft rock or hard rock to the approval of the structural engineer. B. The Building structure shall generally be in reinforced concrete to floor slabs, beams, columns and steps C. External shall generally be in machine cut, first quality stone and internal walling shall generally be in machine cut, first quality stone & glass partitioning. D. Concealed interlocking roof sheeting sheet roof on a steel truss structure. E. Doors shall include hollow core timber framed doors, Aluminum doors, galvanized roller shutter doors and steel doors. F. Windows are generally steel glazed with 6mm thick clear glass and 8mm toughened glazing. G. Floor finishes are generally ceramic and porcelain tiles, terrazzo, rubber tiles to general spaces and staircase risers & steps H. Internal wall finishes shall be plaster and paint, and ceramic wall tiles to wet areas. External walls have a mixture of plaster and weather guard paint, key pointing to architect's design. J. Ceiling finishes are plaster and paint, tng bords and acoustic ceiling K. Stainless steel balustrading to staircase and balconies		
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
	BRIEF DESCRIPTION OF THE WORKS (Ctd)		
	Specialist works and installation to be carried out by specialist firms shallinclude the following :-		
	1.Electrical Installations including electrical wiring and conduiting / trunking for lighting and power installations, light fittings, fire alarm system, security lighting, trunking/conduiting for telephone/and security installations (CCTV), power distribution, switchgear and lightning protection, smoke detectors etc.		
	2.Kenya Power Connection Charges		
	3.Plumbing, Drainage and installations including sanitary fittings and accessories, internal plumbing and drainage, external water supply and reticulation including roof water storage tanks and booster pumps,etc.		
A.	EXCLUSIONS FROM CONTRACT		
	The following works are excluded from the Contract:-		
	Vertical Blinds and Curtains		
	Loose Furniture, Furnishings & Equipment		
	NEMA and Council Approval Fees		
	Professional Fees and Disbursements		
B.	EXTERNAL		
	The external work comprises: I. On and Off plot roads and driveways		
	II. Foul water drainage		
	III. On and Off plot stormwater drainage		
	IV. Gate House		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	DRAWINGS		
	The drawings used in the preparation of these Bills of Quantities are scheduled on Pages 1/8 hereof and are deemed to be the Tender and Contract Drawings. A set of the basic Architectural drawings is enclosed with the tender documents. The rest of the drawings are however available for inspection at the offices of the Architects or Quantity Surveyors during normal working hours by prior appointment.		
	The Tenderer's attention is drawn to the fact that references have been made to some drawings in the measured section of the Bills of Quantities. If not amongst the tender drawings, such drawings can be inspected by Tenderers at the Architects' offices by prior appointment	IMPORTANT NOTE	
B.	SITE		
	The site is located on PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101		
	Tenderers are strongly recommended to visit the site and if unable to locate it to apply to the Architects for direction to enable them to do so.	NOTE	
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd) SITE (Ctd.)	Shs.	Cts.
	The Tenderer shall be deemed to have examined and fully acquainted himself with the site and its nature and position, means of access, nearest water and electricity supplies etc. and make all necessary allowances and provisions for overcoming any difficulties which may arise therefrom as no claim for want of knowledge in this respect will be allowed. No claims will be allowed for travelling or other expenses, which may be incurred by the Contractor in visiting the site or preparing the tender for these works.		
A.	TEMPORARY OFFICES AND SHEDS The Contractor shall erect and maintain temporary office accommodation for his own use and ample temporary watertight sheds for the proper storage and protection of materials and for the use of artisans and remove when ordered. Floors of sheds shall be at least 100mm above ground level.		
B.	LABOUR CAMPS The Contractor shall **NOT** be permitted to house workers on site and must make arrangements to transport them to and from site on a daily basis.		
C.	PHASED IMPLEMENTATION AND SECTIONAL COMPLETION **Although sectional completion is not contemplated, the Contractor shall abide by any phased implementation of the works that may be directed by the Architect to suit the requirements of the Employer.** **Tenderers are also notified that no contractual claims or increase in prices will be allowed due to any Phased implementation of the works** The last of the contract works are however to be completed within the overall Contract Completion Period		
D.	FIXED RATE CONTRACT The Tenderers attention is drawn to the fact that this is a fixed rate contract. No claim for increased costs will be entertained and the Contractor must allow in his tender for any increases in the cost of labour, materials and plant which may occur during the currency of the Contract. The whole of clause 35 relating to price fluctuations shall therefore be deleted.		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	COMPLIANCE WITH LABOUR LAWS AND REGULATIONS The successful Tenderer shall be required to comply with all regulations relating to employment of labour, safety of labour, provision of sanitary facilities, first aid etc. The Contractor shall be required to provide toilets and shower facilities, safety implements for workers (helmets, overalls, gloves etc.) The Contractor shall be required to indemnify the Employer for any claims arising out of non- compliance with the above requirements.		
B.	ATTENDANCE TO FIT-OUT CONTRACTORS The Tenderer's attention is drawn to the fact that Contractors employed by the Client may commence fit-out work within the building before Practical Completion. The Contractor shall be required to provide all necessary cooperation, attendance and assistance to such Contractors to enable them to carry out their work without undue hindrance.		
	Carried to Part Summary		

PART NO. 3 (Ctd.)	Shs.	Cts.
PARTICULAR PRELIMINARIES (Ctd.)		
PARTICULARS OF INSERTIONS TO BE MADE IN APPENDIX TO CONTRACT		
The following are the insertions to be made in the Appendix to the Contract Agreement		
	CLAUSE	
Percentage to cover professional fees for insurance purposes only	13	Not Applicable
Name of Contractor's Surety	16.1	(Contractor to propose and state herein)
Amount of Surety	16.1	Ten percent (10%) of contract sum
Name of Employer's Surety	16.2	Not applicable (To be deleted)
Amount of Surety	16.2	Not applicable (To be deleted)
Period for submission of programme	18.1	Two (2) calendar weeks from date of acceptance of tender
Period for possession of site	20.1	Immediately after acceptance of tender
Contract period	20.2	As indicated in the Letter of bid
Date of commencement of works	20.2	Two (2) weeks after acceptance of tender
Date for practical completion	20.2	As indicated in the letter of award
Name of the Bank for purposes of interest calculation	31..14 32.4.5 34.6	Mean rate of a commercial bank acceptable to the client & Contractor
Interval for application of payment certificates	34.1	One (1) calendar month
Minimum amount of payment certificate	34.4	Not Applicable
Percentage of certified value retained	34.12	Ten percent (10%)
Limit of retention fund	34.12	Five percent (5%) of contract sum or provisional final account amount whichever is higher
Periods for release of interest on retention money to Contractor	34.15	Not Applicable (To be deleted)
Period of final measurement and valuation	34.17	Six (6) calendar months from date of practical completion
Defects Liability Period	41.6	Six (6) Calendar months
Damages for delay in completion (for Whole Project)	43.1	At the rate of Kshs. 2,500,000.00 (incl. VAT) per calendar week or part thereof
Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	CLIENT SUPPLY MATERIALS The Employer reserves the right to supply any local or imported materials required for this Contract, whether measured or allowed as a P.C. or Provisional Sum in the B.Q. In the event of the Client exercising this right, the Q.S. or the Services Engineer will adjust the Contract or Sub-Contract Sum accordingly and no claims from the Main Contractor or Sub-Contractors will be accepted inthis regard.	IMPORTANT CLAUSE	
B.	VALUE ADDED TAX (V.A.T.) ON CONSTRUCTION SERVICES	IMPORTANT CLAUSE	
C.	INSURANCES AND PERFORMANCE BOND The Contractor will be required to take out all necessary insurances under the Contract and obtain the Performance Bond from an approved Insurance Company. The insurance cover shall include Contractor's All Risks Policies, Third Party Liability and Workmen's Compensation. The Contractor shall further indemnify the Employer against all claims arising out of the execution of the Contract Works.	Also see pages 2/5 to 2/7 and item B on page 2/23	
D.	STATUTORY APPROVALS The Employer has applied for the necessary statutory approvals required before commencement of the works. As the granting of the approvals is not guaranteed and is beyond the control of the Employer, no claims for loss of profit or other claims shall be entertained in case approvals are notgranted or are withdrawn after commencement.		
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
A.	EXISTING SERVICE LINES		
	The Tenderer's attention is drawn to the possibility of some existing utility cables/pipes on site. Before commencing any excavations/demolitions, the Contractor will be required to ascertain the location of such services and ascertain whether they are "live" or not. The Contractor shall be deemed to have allowed for liaising with the necessary authorities with regard to the termination/re-routing of any service pipes/cables including paying for all related charges.		
	Extreme care must be taken at all times to ensure that existing drainage and water supply pipes, electric and communication cables, underground drains and other service lines are not damaged during excavation or other building operations and all necessary precautions must be taken to avoid such occurrence.		
	Should such damage nevertheless occur, the Contractor shall immediately inform the Architect and then proceed expeditiously with the repairing of such damage at his own cost.		
	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.	IMPORTANT NOTE	
	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 and Employer's maintenance department 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.		
	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.		
B.	DEMOLITIONS AND DOWNTAKINGS		
	Unless otherwise stated, all salvageable materials arising from any Demolitions and Down takings shall become the property of the Employer.		
	All such materials shall be carefully removed, taken down or dismantled and handed over to the Employer under recorded delivery unless instructed by the Architect to remove them from the site.		
	Such materials shall only be incorporated in the new works if required by the Architect in which case appropriate adjustments will be made in the Final Account for the cost of labour, screws, etc. for fixing such down takings in the new work		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	OFFICES AND OTHER FACILITIES FOR THE CONSULTANTS, ETC. Item B Page 2/20 of the General Preliminaries shall apply. The Contractor shall be required to erect a temporary office for the soleuse of the Employer, Consultants and Clerk of Works. The Contractor shall also be required to provide the necessary furniture such as chairs, tables, etc. for the use of the occupants and for purposes ofholding site meetings. He shall provide, erect and maintain a lockup western type water closet forthe 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 provide the services of a cleaner and 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.		
B.	TELECOMMUNICATION FACILITIES The Contractor shall provide a telephone, a fax machine, a computer, colour printer and e-mail facility from the commencement to completion of the works for the sole official use of the Employer, Consultants, Clerkof Works and Sub-Contractors. The Telephone and fax shall have their own connections to the local exchange. The Contractor shall apply and arrange for the installation of these facilities and pay all charges in connection with the installations, rental, andremoval and for usage by his own staff, his Sub-Contractors and all other parties mentioned above.		
C.	WATCHING AND LIGHTING 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. All watching and lighting shall comply with the requirements of the Employer and the Local Authority By-Laws and Police regulations and theContractor shall give all requisite notices to these authorities.		
D.	TEMPORARY DISPOSAL OF RAINWATER The Contractor shall provide and maintain all necessary temporary gutters, downpipes, chutes, drains, etc. for conveying rainwater from the buildings. The Contractor shall allow for temporary drainage, pumping and pipingfor keeping the premises and site free from accumulation of water.		
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
A.	DISTURBANCE Tenderers should note that normal activities shall be continuing within andin the surrounding building during the construction period. 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. TheContractor shall comply with all instructions issued by the Employer or Architect with regard to minimizing such disturbances.		
B.	WATER FOR THE WORKS Item C Page 2/20 of the General Preliminaries shall apply. Alternatively, he may make a separate arrangement with the Employer for temporary connection to the existing mains and pay for all associated charges for connection and construction and consumption. The Contractor shall provide at his own risk and cost all necessary waterrequired for the works including connecting to the mains, making arrangements with the Employer for temporary connection and paying all costs for connection and for water consumed and removing temporary connections on completion. No claims for lack of water or water pressure will however be entertained. All water shall be fresh, clean, pure and free from earthy vegetable or organic matter and acid or alkaline substances in solution or suspension and shall be tested whenever required by the Architect.		
C.	ELECTRICITY FOR THE WORKS Item C Page 2/20 of the General Preliminaries shall apply. The Contractor may install his own generator on site with the approval ofthe K.P.L.C. if required. Alternatively, he may make a separate arrangement at his own risk with theEmployer for temporary connection and supply of electricity for the works and pay all associated charges for connection and consumption No claims due to lack of electricity or due to power fluctuations will be accepted	IMPORTANT NOTE	
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
A.	SITE PHOTOGRAPHS		
	The Contractor shall take and hand over to the Architect at approved intervals site progress photographs in a format to be directed by the Architect.		
B.	SIGNBOARD		
	The Tenderer shall allow for providing, erecting and maintaining throughout the course of the Contract and afterwards clearing away a signboard in accordance with a drawing to be issued by the Architect.		
	No other signboards or advertising will be permitted without the written authority of the Employer and Architect. The Contractor will be required to strictly adhere to this rule throughout the course of the Contract.		
	The signboard comprises a strong well braced frame set in foundations with a "title" board and separate boards for the Client, all Consultants, Main and Sub-Contractors. The whole of the supports and boards must be well painted and the lettering which must not exceed 50mm high on the Consultants boards, motifs, etc must be carried out by an experienced signwriter to the approval of the Architect.		
C.	TEMPORARY HOARDING AND CATCHMENTS SHUTTERING AROUND WORKING AREAS		
	Temporary hoarding shall be provided all around the site. The tenderersamount 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 shall be to the successful Tenderer's design and to the approval of the Architect and shall comply with the following:-		
	The hoarding shall be constructed in new 24 gauge corrugated galvanised new iron sheeting approximately 250m long x 3m high mounted on timber or steel framing and adequately supported by props, bearers and bracketsat appropriate centres all to the entire satisfaction and approval of the Architect and Structural Engineers. Vehicular and pedestrian gates shall be provided. Previously used sheeting shall not be used for hoarding.		
	The external surfaces of the hoarding shall be primed and painted withundercoat and one finishing coat gloss oil plant.	NOTE	
	Advertisements on the hoarding will only be allowed with the expressapproval of the Architect.		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	SECURITY Maximum precautions must be exercised to uphold existing security in the vicinity of the Works. The Contractor shall comply with all instructions issued by the Employer or Architect with regard to upholding of security arrangements and will be held responsible for any breach of security by his employees. The movement of the Contractor's men must be confined strictly to theWorks and the Contractor's working and storage areas. Certain areas within and adjacent to the site and to be identified later, will be designed "Out of Bounds" areas for the Contractor's employees and the Contractor will be required to comply strictly with this rule.		
B.	HEALTH & SAFETY 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. NOTE: The Contractor will be held responsible in accordance with relevant Rules for serving on the Chief Inspector of Factories a written Notice not later than Seven (7) days after the beginning of the building operations included in this Contract stating the particulars included in this Contract. 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. The Contractor will also be required to provide approved hard hats and gumboots (Wellingtons) 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. The Tenderer's 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 Contractor's part of his obligations under this Clause. The tenderer's 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.	IMPORTANT NOTE	
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
A.	TRAFFIC ARRANGEMENTS		
	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.		
	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.	IMPORTANT NOTE	
B.	SANITATION OF THE WORKS		
	The Contractor **must** provide the necessary sanitary facilities for his staff and workmen. Any temporary toilet facilities shall be erected and maintained to the requirements and satisfaction of the Local and Health Authorities and shall be kept at all times in a thoroughly clean and sanitary condition and the ground made good when no longer required to the satisfaction of the Architect.		
C.	RESTORATION OF DAMAGE TO EXISTING PROPERTY		
	The Contractor shall exercise utmost care and precaution to ensure that all existing property is well protected during construction operations. Any damage to such property caused by the Contractors' workmen or Sub-Contractors shall be repaired or restored to the Architect and Employer's satisfaction at the Contractor's expense		
D.	CLERK OF WORKS		
	The Employer may appoint a Clerk of Works for the Project. The Contractor shall provide the Clerk of Works with every reasonable facility that he requires to carry out his duties as stipulated in the Conditions of Contract. The facilities include office space and access to telephone, fax and computer services.	**NOTE** See clause 10 item C- Page 2/4	
E.	BLASTING		
	Unless otherwise agreed with the relevant authorities no blasting shall be allowed to be carried out on site. Any rock that is encountered with must be removed by use of sledgehammers, heavy-duty rippers mounted to tractors or by compressor.		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	WORKING HOURS No restrictions will be imposed on working hours. The Contractor may work for twenty four hours a day if he so wishes. The Architect may however require that noisy operations be carried out at certain times to minimize inconvenience to neighbours. The Tenderer must however allow in his Tender price for working overtime if necessary to complete the Contract Works within the overall Contract Completion Period including the provision of flood-lighting and any other expenses in connection therewith and no claim in this respect will be allowed.	IMPORTANT CLAUSE	
B.	OVERTIME The Tenderer must allow in his Tender price for working overtime and at night if necessary to complete the Contract Works within the overall Contract Completion Period including the provision of flood-lighting and any other expense in connection therewith and no claim in this respect will be allowed.		
C.	NOTICES 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. No other signboards or advertising will be permitted without the authority of the Architect.		
D.	HOIST & TACKLE (S) The Contractor will be required to provide approved type(s) of Hoist and Tackle(s) on site for the works. The Tenderer shall allow in his tender for this including its proper maintenance during construction and removal on completion. Allowance should further be made in the Tender for all Local Authority permissions and charges involved and any temporary structural support required by the Structural Engineer. The contractor is required to install, maintain and operate a construction lift throughout the project life. The construction lift should have a load capacity of 1000 kgs with a cage size of 1.2m * 1.2m lifting up to a height of 50m; with a lifting speed of 3.3 metres per minute.	IMPORTANT NOTE	
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
A.	SCAFFOLDING		
	Where required, the Contractor shall provide and erect an approved type of scaffolding and staging maintain for the use of workmen including those of all Sub-Contractors and afterwards dismantle and remove from the site.	Also see item D on page 2/14	
	All scaffolding and staging over two metres in height together with access ladders, ties to walls and handrails, etc shall comply in all respects with the Factories (Building Operations and Work of Engineering Construction) Rules. The Contractor shall in all cases give Notice and obtain the approval of the Architect before erection and give one full week's notice of intention to dismantle the scaffolding and staging to the Architect who shall not unreasonably withhold permission for the dismantling to proceed.		
B.	THE FACTORIES (BUILDING OPERATIONS AND WORK OF ENGINEERING CONSTRUCTION) RULES		
	In addition to complying with the requirements of the Factories Act the Contractor shall comply in all respects with the above mentioned Rules.		
	NOTE:		
	The Contractor will be held responsible in accordance with relevant Rules for serving on the Chief Inspector of Factories a written Notice not later than **Seven (7) days** after the beginning of the building operations included in this Contract stating the particulars included in this Contract.	IMPORTANT CLAUSE	
	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.		
	The Contractor will be required to provide hard hats and gumboots (Wellingtons) for all workers on site including Sub-Contractors' workers and also for the exclusive use by the Employers, Clerk of Works and Consultants.		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	TEMPORARY STRUCTURES The Contractor shall allow for providing and clearing away on completion of the Works such as temporary hoardings, fencing, gates, planked walkways, guard rails, etc. may be necessary for the protection of the workers, occupants of the building and adjacent structures and for the proper execution of the Works. All 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 inconveniences and disturbance to pedestrians and road users using the adjacent roads. All such temporary structures shall comply in all respects with the National laws, rules and regulations currently in force and applicable to such structures. All temporary structures shall be erected in a manner so that the unloading or loading 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. All temporary structures shall be maintained at all times in good order and condition to the satisfaction of the Architect. All temporary structures shall be removed when so required by the Architect or at the end of the period for which it is required. The Contractor shall indemnify and shall keep the Employer indemnified against any expense, loss, claim or in connection with the temporary structures.		
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
A.	CONTRACTOR'S WORKING AREA, ACCESS AND MOVEMENTS		
	The Contractor's working storage and dumping area and all his activities will be confined to locations to be agreed with the Architect at the commencement of the works.		
	The movement of the Contractor's vehicles and workmen will be restricted to areas and routes to be agreed with the Architect before commencing the Contract Works and these should strictly be adhered tothroughout the course of the Contract unless otherwise agreed.		
B.	PURCHASE OF BUILDING MATERIALS IN ADVANCE		
	The Contractor will be required, immediately after the signing of the Contract to purchase in advance as much as possible of the building material requirements of the Contract.		
	To qualify for inclusion in the interim payment certificates all such materials shall be suitably stored on site or in an approved bonded warehouse adequately insured against theft and damage for the period of storage, all to the approval of the Architect.		
	Where any material is not immediately available the appropriate orders must be placed as soon as possible after the signing of the Contract and all appropriate measures must be taken to secure early delivery of such materials.		
C.	DAYWORKS		
	The Architect may, if in his opinion it is necessary or desirable, order in writing that any additional or substituted work shall be executed on a Daywork basis. The Contractor shall then be paid for such work in accordance with Dayworks rates and percentage additions to be agreed with the Quantity Surveyor.		
	The Contractor shall furnish to the Architect all receipts or vouchers as may be necessary to prove the amounts paid and before ordering materials shall submit to the Architect quotations for the same for his approval.		
	In respect of all work executed on a Daywork basis the Contractor shall, during the continuance of such work, deliver each day to the Architect alist in duplicate of the names, occupation and time of all workmen employed on such work and a statement also in duplicate showing the description and quantity of all materials and plant used thereon or thereof(other than plant which is included in the percentage addition on net amount of wages). One copy of each list and statement will, if correct orwhen agreed, be signed by the Architect and returned to the Contractor.	**NOTE** See Clause 30 on page 2/8	
	Carried to Part Summary		

	PART NO. 3 (Ctd	Shs.	Cts.
	PARTICULAR PRELIMINARIES (Ctd)		
	DAYWORKS(Ctd)		
	At the end of each month the Contractor shall deliver to the Architect a priced statement of the labour, material and plant (except as aforesaid) used and the Contractor shall not be entitled to any payment unless such lists and statements have been fully and punctually rendered. Provided always that, if the Architect shall consider that any reason the sending of such list or statement by the Contractor in accordance with the foregoing provision was impracticable, he shall nevertheless be entitled to authorize payment for such work either as Daywork (on being satisfied as to the time employed and plant and materials used on such work) or at such value thereof as he shall consider fair and reasonable.		
A.	PRACTICAL COMPLETION AND DEFECTS LIABILITY		
	If any defect be such that in the opinion of the Architect, it shall be impracticable or inconvenient to remedy the same, he shall ascertain the diminution in the value of the works due to the existence of such defects and deduct the amount of such diminution from the sum remaining to be paid to the Contractor, or, failing such remainder, it shall be recoverable as a liquidated demand in money.		
B.	NOMINATED SUB- CONTRACTORS AND NOMINATED SUPPLIERS		
	The Contractor shall also accept liability for and bear the cost of General and Specific Attendance on Nominated Sub-Contractors which shall be deemed to include for :-		
	Allowing the use of standing, scaffolding, providing special scaffolding, retention, maintenance and alteration of all scaffolding until such time as all relevant Sub-Contractors works are complete and removal of all scaffolding on completion.	Also see clauses 31& 32 on pages 2/9& 2/10	
	Providing reasonable office accommodation and stores for storage of plant and materials; allowing use of sanitary accommodation; the supply of all necessary water, power, lighting and watching and clearing away all rubbish		
	Hacking surfaces to receive finishes as required by Sub-Contractors		
	In addition to the definition of "attendance" given on Page 2/23 of the General Preliminaries, the items for "attendance" given hereafter following P.C. in respect of the Sub-Contractor's work shall be deemed to include all the above		
	Builder's work in connection with the Sub-Contract such as cutting away for and making good after work of the Sub-Contractor as may be required is allowed for as an item following the P.C. Sums.		
	Carried to Part Summary		

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)	Shs.	Cts.
A.	UNAVOIDABLE DELAYS IN IMPORTED MATERIALS During the progress of the work where delays are anticipated in obtaining imported materials or locally manufactured materials requiring imported components, the Architect should be informed in writing as early as possible. An application for extensions(s) of time must also be made in writing at the same time. Where the accepted Contractor can fully substantiate with documentary evidence that every effort has been made including the option of air- freighting imported materials and the correct procedures followed for obtaining the materials or where applicable the import licenses and the delays are unavoidable, the Architect will, if satisfied, not unreasonably withhold the granting of such extension(s) of time and Liquidated and Ascertained Damages will NOT then be imposed on such delays. The successful Contractor will, however, be expected to place appropriate orders for all imported and locally manufactured materials immediately after the signing of the Contract Agreement in order to minimize the risk of delays caused through shortages of materials. The Tenderer should state below in the space provided any materials which in his opinion it is anticipated may be short supply and likely to cause such delays: .... Carried to Part Summary		

		Shs.	Cts.
	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd)		
A.	ADDITIONAL ITEMS Any additional item (s) which the Tenderer may wish to price separately and which he considers has NOT been included in the foregoing Conditions, Specification and/or Bills of Quantities. Description …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… …………………………………………………………………………………… ……………………………………………………………………………………		
	Carried to Part Summary		

Part 3 Summary

	PART NO. 3 (Ctd PARTICULAR PRELIMINARIES (Ctd) PART SUMMARY	Shs.	Cts.
	Brought Forward From Page No. 3/1	..	
	" " " Page No. 3/2	..	
	" " " Page No. 3/3	..	
	" " " Page No. 3/4	..	
	" " " Page No. 3/5	..	
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	" " " Page No. 3/21	..	
	TOTAL AMOUNT OF PART NO. 3 PARTICULAR PRELIMINARIES		
	Carried to Main Summary Shs.		

Part No.4 Specifications
GENERAL DESCRIPTION OF MATERIALS AND WORKMANSHIP

The following apply to all sections hereafter

QUALITY, SAMPLES, TESTING AND APPROVAL

A. **Materials**

Materials, commodities, components and equipment are to be new and unused unless otherwise specified. Handle, store, fix and protect all commodities with care to ensure that they are in perfect condition when incorporated into the work and handed over on completion.

B. **Manufacturer's Recommendations**

Handle, store and fix every commodity strictly in accordance with the printed or written recommendations of the manufacturer and/or supplier. Supply the Architect with copies of manufacturers' recommendations. Inform the Architect if manufacturers' recommendations conflictwith any other specified requirements, and obtain his instructions before proceeding.

C. **Standards.**

Where commodities or workmanship are specified by reference to British Standards (B.S.) or Codes of Practice (C.P) or International (I.S.O.) or other standards, such standards are deemed to be thelast published at the time of tendering. The Contractor will be deemed to have read and understood the standards specified, and no claim for want of knowledge will be allowed. The substitution of commodities or standards of workmanship complying with other standards may be allowed at the discretion of the Architect, but application for permission for such substitution must be made in writing in sufficient time to allow adequate investigation. Obtain Certificates of Compliance with standards and supply to the Architect on request.

D. **Local Conditions**

All materials, commodities, components and equipment must be suitable for use in tropical climates

E. **Samples**

Where samples of commodities or specimens of finished work are specified, submit samples or specimens to the Architect and obtain his approval before confirming orders or carrying out the work. Retain approved samples and specimens on Site for comparison with the finished work. Finished work must conform in all respects with the samples or specimens approved. Remove samples and specimens when no longer required. The cost of supplying samples and specimens must be borne by the Contractor, but specimens may form part of the finished work where approved by the Architect.

EXCAVATIONS AND EARTHWORKS

A. **Examine the Site**

The Contractor is assumed to have examined the site carefully and ascertain for himself its natureand the kinds of materials to be excavated.

B. **Excavations**

Excavations shall be to the widths and depths indicated on the Drawings or to such lesser or greater depths as the Engineer may deem necessary and so instruct the Contractor in order to obtain satisfactory foundations.

Any difference in the quantity of work actually executed under such instructions and that shown on the drawings shall be measured and valued by the Engineer as a Variation under the relevant Conditions of Contract and priced in accordance with the Schedule of Rates.

If, however, the Contractor excavates to any greater depths or widths than are shown on the Drawings or directed, then the Contractor shall, at his own expense, satisfactorily fill in such extra depth and width with concrete similar to that described for foundations.

C. **Formation Level**

Formation level on embankments and in cuttings shall be the surface level of the ground obtained after completion of the earthworks, i.e. the underside of the sub-base, or where no sub-base is specified, the underside of the base. Any excess depth unnecessarily excavated below formation level shall be backfilled with material acceptable for construction and compacted as directed by the Engineer and no payment shall be made for the excess excavation or for the filling and compacting. The levels and tolerance of irregularity of the surface of the course shall be within the limits specified in Clause 6.17 for sub-grade.

D. **Surface Soil**

Unless otherwise directed by the Engineer all surface soil shall be removed from the area to be used for cuttings and embankments and stockpiled for re-use and for any purpose such as the soiling of slopes of cuttings and embankments, herms, verges, central reserve and the preparation of beds for the cultivation of trees and shrubs.

Surface soil shall be regarded as soil which on visual examination can be seen to have been broken down by agricultural cultivation and/or is seen to be capable of supporting vegetable growth.

Surface soil shall be removed to an average depth as shown on the Drawings or specified in the Billsof Quantities.

EXCAVATIONS AND EARTHWORKS (Ctd.)

A. **Surface Soil (Ctd).**

The Contractor shall make his own arrangements for temporary storage sites for heaps of surface soil either inside or outside the Site of the Works to suit his convenience. The cost of all operations needed in excavating, loading, carting, depositing and stacking, together with arranging for the storage sites, the hire or purchase of land therefore and all necessary access roads for this purpose is to be included in the item in the Bills of Quantities for stripping surface soil and is to be quoted whatever the nature of the underlying sub-soil.

All unsuitable soil comprising or underlying surface soil shall be excavated and run to spoil in accordance with Clause 2.7.

B. **Bottoms of Excavations to Receive Foundations**

The Contractor shall report to the Engineer when secure bottoms to the excavations have been obtained. Any concrete or other work executed before the excavations have been inspected and approved shall, if so directed, be removed and new work substituted after the excavations have been approved, all at the Contractor's expense.

The surface of the bottoms to excavations to receive foundations shall be levelled or graded to fallsas required.

C. **Soiling of Side Slopes and Verges**

Soiling and compacting of the side slopes of cuttings and embankments shall be carried out to an even surface with a thickness within the range 100mm – 200mm, or in the case of verges as stated inthe Bills of Quantities with surface soil as previously stockpiled or from an approved source.

Grass planting shall be carried out in accordance with Clause 7.19.

D. **Rock**

Excavation in rock shall exclude all materials which can be removed by hand and does not necessarily require the use of compressors or other mechanical equipment, although the Contractor may use such equipment to loosen the material for ease of its removal. All topsoil, black cotton and other clay soils, murram, stone and other fill and all similar materials will NOT be classified as rock.

EXCAVATIONS AND EARTHWORKS (Ctd.)

A. **Definition and Classification of Excavated Material**

Excavation in solid rock in the Bills of Quantities will be itemised in three Classes: -

(i) **Class I:**

Soft rock of the type known locally as "tuff" or "magadi" which in the opinion of the Engineer cannot be considered as hard rock but which considerably increases the amount of labour needed for its removal shall be known as Class I rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.

(ii) **Class II:**

Very weathered black trap or lava containing many fissures and faults shall be known as Class II rock. This type of rock contains stones and boulders of unweathered or incompletelyweathered black trap or lava. A boulder or outcrop of harder rock 13.5 cu. Metre or less, andfirst quality Nairobi blue, grey or green building stone in a formation which is massive and geologically homogenous, will be deemed to be Class II rock.

(iii) **Class III:**

Black trap in a formation which is massive and geologically homogenous shall be known as Class III rock.

NOTE: The opinion of the Engineer in classifying rock shall be final and binding.

Common excavation shall mean excavation in any material which are not solid rock asdefined in this Clause.

All excavation shall be classified either as unsuitable materials or as suitable material.Unsuitable material shall comprise: -

(i) Material from swamps or marshes, silt, perishable material, slurry or mud; or

(ii) Any material: -

(a) Which is highly organic clay or silt;

(b) Which is clay having a liquid limit exceeding 8. and/or a plasticity indexexceeding 55;

(c) Which is outside the limits of moisture content specified in the earthworksseries of Clauses either when excavated or thereafter;

(d) Which is susceptible to spontaneous combustion;

EXCAVATIONS AND EARTHWORKS (Ctd.)

A. **Definition and Classification of Excavated Material (ctd).**

(iii) **Class III: (Ctd).**

(e) Consisting of such domestic refuse which by virtue of its physical or chemicalcomposition or moisture content will not compact to form a stable fill.

Suitable material shall comprise all that which is acceptable in accordance with the requirements of the Specification for use in the Works, whether obtained from within or without the Site. Any reference in this and other Clauses of the Specification to suitable material and unsuitable material shall have the meanings defined above.

For the purpose of selection for use in earthworks all common excavation shall be classified aseither plastic or non-plastic. Non-plastic materials shall be defined as those on which it is impossible to carry out a plasticity index text and shall include "coarse-grained, non-cohesive materials" included in Table 1 of British Standard Code of Practice CP 2.1:

The Engineer's decision shall be final with regard to the classification of excavated materials.

B. **Storage and Handling of Explosives and Blasting**

The removal of hard materials by use of explosives will normally be permitted subject to compliance by the Contractor in all respects with the Explosive Laws of Kenya.

In the Bills of Quantities rock may be sub-classified into rock where blasting will be permitted subject to this Clause and rock where blasting will not be permitted.

The Contractor shall provide proper buildings or magazine in suitable positions for the storage of explosives in manner and quantities to be approved; he shall also be responsible for the preventionof any unauthorised issue or improper use of any explosives brought on the Works and shall employ only experienced and responsible men to handle explosives for the purpose of the Works.

The shots shall be properly loaded and tamped and, where necessary, the Contractor shall use heavy mesh blasting nets. Blasting shall be restricted to such periods and such parts of the Works as the Engineer may prescribe. If, in the opinion of the Engineer, blasting would be dangerous to persons or property or any finished work or is being carried on in a reckless manner, he may prohibit it, and order the rock to be excavated in other means and payment will be made at the rate for rock excavation where blasting is permitted. The use of explosives by the Contractor in large blasts, as inseams, drifts, shafts, pits, or large holes, is prohibited unless authorized in writing by the Engineer.In the event of wasting of rock through any such blasting, the Contractor shall, if required by the Engineer, furnish an equivalent amount of approved materials for embankments, 1 cu. Metre or rockinsitu being taken to equal 2.5 cu. Metre of material in embankment.

EXCAVATIONS AND EARTHWORKS (Ctd.)

A. **Excavation of Cuttings**

The Contractor shall carry out the excavation of cuttings in accordance with the Drawings and shalladhere to the slopes, levels, depths and heights shown thereon.

The sloping sides of all cuttings shall be cleared of all rock fragments which move when priced witha crowbar and are therefore liable to cause injury or damage through falling.

NB: No blasting will be permitted without the prior approval of Local Authorities and Engineer.

B. **Cart Away**

All surplus excavated material shall be removed to spoil, within the site as directed by the Engineer.

C. **Filling Obtained from the Excavations**

Filling obtained from surplus excavated materials will only be incorporated if suitable materialarises and is to be free from all weeds, roots, vegetable soil or other unstable materials and is to be filled in layers each of not more than 225 mm finished thickness. Each layer to be well wetted and consolidated as described Filling obtained from surplus excavated materials will only be incorporated if suitable material arises and is to be free from all weeds, roots, vegetable soil or other unstable materials and is to be filled in layers each of not more than 225 mm finished thickness.

D. **Back Filling**

Filling under floors, etc., shall be good hard stone ballast or quarry waste (or crusher run) or soft rock to the approval of the Engineer, broken to pass not greater than a 150mm ring or to be 75% of the finished thickness of the layers being compacted, whichever is the lesser. The fill material shall be free from all weeds, roots, vegetable soil, clay, black cotton soil or other unstable materials. It shall be well graded with smaller stones and fine materials to give a dense compact mass after consolidation. Sufficient fine materials shall be added to each layer to give gradation of material as necessary to obtain a solid compact mass after rolling. The fill material is to be laid in layers each of a consolidated thickness not exceeding 225mm. Each layer shall be compacted to at least a dry density of 95% MDD, to achieve this allow for at least a 10 tonne (static weight) vibrating roller. Sufficient water ie 80% to 105% of Optimum Moisture Content unless stated otherwise by the Engineer is to be added to obtain the stated minimum compaction.

A. **Back Filling (Ctd).**

The Contractor will be required perform sufficient numbers compaction tests in accordance with BS 1377:1975 on each layer and provide results to the Engineer for approval. In case of any doubt the Engineer may direct the contractor for further tests.

The top surface of the filling shall be levelled or graded to falls as required and shall then be blindedwith a layer of similar material broken to 25mm gauge and surfaced with a 25mm layer of stonedust, watered and consolidated by an 8 to 10 tonne smooth-wheeled roller. The surface so obtained shall be to the Engineer's approval.

B. **Materials Found in Excavations**

No sand, aggregate, murram or other material found in the excavations is to be used in the Workswithout the written permission of the Engineer.

C. **Polythene Sheeting**

Polythene sheeting shall be 1000 gauge and as approved. Joints in sheeting shall be treble folded with 150mm fold and taped at 300mm intervals with 50mm wide approved black plastic adhesive tape. The sheeting shall not be stretched but shall be laid loose with sufficient wrinkles to permit shrinkage up to 15%.

D. **Notes Concerning Pricing and Measurement**

The rates for excavation, including excavation in rock, MUST INCLUDE for trimming and preparing bottoms and all faces to receive concrete, and for any extra excavation required for planking and strutting.

Prices shall include for excavating in any material encountered unless specifically otherwise described, handling of extra bulk after excavating, or before consolidating, grubbing up any old drains, roots, etc., that may be encountered, trimming excavation or filling to embankments and batters, and carting away to spoil.

The Contractor shall allow and make provision for keeping the whole of the excavations thoroughly drained and clear of water below the lowest level of any part of the excavation for as long as may berequired. The Contractor shall provide petrol or hand pumps or other mechanical appliances, pipes, chutes, dams, manholes, sumps, diversions or any other means necessary for that purpose. Water pumped from the trenches shall not be allowed to run down the road channels but shall be conveyed to the nearest surface water sewer, ditch or river through troughs, chutes or pipes.

CONCRETE WORK

A. **Bending Schedules**

The Engineer will issue bar bending schedules in accordance with B.S. 4466. The Contractor should check these against the Drawings before any cutting, bending or construction involving the schedules is started. Any discrepancy should be reported to the Engineer immediately for his clarification. The Contractor shall be responsible for any delays or additional work caused solely by his failure to check the schedules.

B. **Code of Practice**

All workmanship, materials, tests and performance in connection with the reinforced concrete work are to be in conformity with the latest edition of the British Standard (BS) Code of Practice (C.P) 8110 "The Structural Use of Concrete" where not inconsistent with this Specification.

C. **Supervision & Inspection**

A competent person approved by the Engineer shall be employed by the Contractor whose duty will be to supervise all stages in the preparation and placing of the concrete. All cubes shall be made andsite tests carried out under his direct supervision in consultation with the Engineer.

The contractor shall give the Engineer at least 48hr notice to inspect any part of the work, this time shall be doubled if the site is more than 100 km from the nearest permanent office of the Engineer.

D. **Contractor's Plant, Equipment and Construction Procedures**

Not less than 30 days prior to the installation of the Contractor's plant and equipment for processing, handling, transporting, storing and proportioning ingredients, and for mixing, transporting and placing concrete, the Contractor shall submit drawings for approval by the Engineer, showing the proposed general plant arrangements together with a general description of the equipment he proposes to use.
After completion of installation, the operation of the plant and equipment shall be subject to theapproval of the Engineer.

Where this Specification or the Drawings require specific procedures to be followed, such requirements are not to be construed as prohibiting use by the Contractor of alternative procedures ifit can be demonstrated to the satisfaction of the Engineer that equal results will be obtained by the use of such alternatives.

Approval of plant and equipment or their operation, or of any construction procedure, shall not operate to waive or modify any provision or requirements contained in this Specification governing the quality of the materials or the finished work.

A. **Tolerances**

On all setting out dimensions of 5 metres and over a maximum non-accumulative tolerance of plusor minus 5 millimetres will be allowed. On all setting out dimensions under 5 metres a maximum non-accumulative tolerance of plus or minus 3 millimetres will be allowed. On the cross-sectional dimensions of structural members, unless otherwise required by the Drawings, a maximum toleranceof plus or minus 3 millimetres will be permitted.

The top surface of concrete floor slabs and beams shall be within 6 millimetres of the normal level and line shown on the Drawings. Columns shall be truly plumb and non-accumulative tolerance of 3 millimetres in each storey and not more than 15 millimetres out of plumb in their full height willbe permitted. The Contractor shall be responsible for the cost of all corrective measures required bythe Engineer to rectify work which is not constructed with the tolerances set out above.

B. **Materials Generally**

All materials which have been damaged, contaminated or have deteriorated or do not comply in any way with the requirements of this Specification shall be rejected and shall be removed immediately from the Site at the Contractor's expense. No materials shall be stored or stacked on floors without the Engineer's prior approval.

The sources of supply for all materials used for all concrete work shall be approved by the Engineer before these materials are delivered on the Site. All materials shall comply with the requirements ofthe latest appropriate British Standard unless otherwise agreed with the Engineer, whose approval shall be obtained in writing.

The suppliers of materials shall give the Engineer access to their premises when directed for thepurpose of obtaining samples of the materials for testing.

C. **Samples and Testing**

Samples of materials shall be submitted as soon as possible after the Contract is let. No deliveries inbulk shall be made until the samples are approved by the Engineer. All condemned material shall beremoved from the Site within 24 hours.

Every facility shall be provided to enable the Engineer to obtain samples and carry out tests on the materials and construction. If these tests show that any of the materials or construction do not comply with the requirements of this Specification, the Contractor will be responsible for the costsof the tests and the replacement of defective materials and/or construction.

A. **Cement**

Cement, unless otherwise specified, shall be Portland cement of a brand approved by the Engineer and shall comply with the requirements of B.S. 12 with the exceptions that it may contain reactive volcanic ash (of not more than 10% of the total weight) and the quantity of insoluble residue permitted in B.S. 12 may be exceeded. A Manufacturer's Certificate of Test in accordance with B.S.12 shall be supplied for each consignment delivered to the Site.

Cement may be delivered to the Site either in bags or in bulk.

If delivered in bags, each bag shall be properly sealed and marked with the manufacturer's name andon the Site it is to be stored in a weather-proof shed of adequate dimensions with a raised floor.Each consignment shall be kept separate and marked so that it may be used in the sequence in whichit is received. Any bag found to contain cement which has set or partly set, shall be completely discarded and not used in the Works. Bags shall not be stored more than 1,500mm in height.

If delivered in bulk the cement shall be stored in a weather- proof silo either provided by the cementsupplier or by the Contractor but in either case the silo shall be to the approval of the Engineer.

B.**Aggregates**

Aggregates shall conform with the requirements of B.S. EN 1260 and the sources and types of all aggregates are to be approved in all respects by the Engineer before work commences.

The grading of aggregates shall be one within the limits set out in B.S. EN 1260 and as later specified and the grading, once approved, shall be adhered to throughout the Works and not varied without the approval of the Engineer. Fine aggregate shall be clean, coarse, siliceous sand of good, sharp, hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. It shall be graded within the limits of Zone 1 or 2 of Table 2 of
B.S. 882.

Coarse aggregate shall be good, hard, clean approved black trap or similar stone, free from dust, decomposed stone, clay, earthy matter, foreign substances or friable, thin, elongated or laminated pieces. It shall be graded within the limits of Table 1 of B.S. EN 1260 for its respective nominal size.

If in the opinion of the Engineer the aggregate meets the above requirements but is dirty oradulterated in any manner it shall be screened and/or washed with clean water if he so directs, at the Contractor's expense.
Aggregates shall be delivered to the Site in their prescribed sizes or gradings and shall be stockpiled on paved areas or boarded platforms in separate units to avoid intermixing. On no account shall aggregates be stockpiled on the ground.

C.**Water**

The water used for mixing concrete shall be from an approved source, clean, fresh and free fromharmful matter, and comply with the requirements of B.S. EN 1008

CONCRETE WORK (Ctd).

A. **Ready-Mixed Concrete**

Ready-mixed concrete may only be used with the prior permission of the Engineer. Such permission will impose conditions and controls additional to this Specification to ensure that the quality of the concrete is to the specified standards.

B. **Expansion Joints**

Expansion joint filler shall be as manufactured by an approved manufacturer

C. **Joint Sealer**

Sealers shall be either hot or cold applied. Hot applied sealers shall comply with B.S. EN 14188. Cold mastic shall be applied by gun and where more than 12mm deep shall include filling withloose packing yarn to within 2mm from the outer face. All joint sealers are to be approved by the Engineer prior to their use.

D. **Concrete Strengths**

Concrete mixes shall have the following minimum strengths as given by Works Cube Tests: -

Minimum Crushing Strength:

7 days N/mm2	28 days N/mm2
Class 40	
27	40
Class 35	
24	35
Class 30	
20	30
Class 25	
17	25

The average strength obtained from cube tests shall be 10% higher than the minimum strengthsshown above and shall otherwise conform to the requirements of BS 8110.

Works cube tests will not be required for Class 15 blinding concrete which shall comprise 1:3:6 nominal mix concrete by volume containing 0.10 cu. metres of fine aggregate and 0.20 cu. metres ofcoarse aggregate per 50 kg. bag of cement with 40mm maximum gauge of coarse aggregate.

A. **Measured Proportions of Concrete**

(a) **Cement**

The quantity of cement shall be measured by weight. Where delivered in bags, each batch ofconcrete is to use one or more whole bags of cement.

(b) **Aggregates**

For Class 40 to 25, concrete aggregates shall be measured by weight in a weigh-batching machine, as described hereafter.

For Class 15 concrete, aggregates may be measured by weight or by volume. Where by volume, approved gauge boxes of such a size as will give the correct proportions shall be used.

B. **Weight-Batching Machines**

Weigh-batching machines shall be of an approved type and shall be properly maintained andchecked for accuracy at regular intervals.

C. **Concrete Classes 40 to 25**

The weights of fine and coarse aggregate to be used in concrete Class 40 to 25 shall be limited in accordance with the table below. The proportions of fine to coarse aggregate and cement which the contractor proposes to use for each of the mixes specified shall first be approved by the Engineer. The Contractor will then be required to prepare Preliminary Test Cubes and have these cubes tested as described for Works Cube Tests. The test results shall be submitted to the Engineer in sufficient time for further tests to be carried out should they prove unsatisfactory. Cube strengths in the preliminary tests must show crushing strengths at least 25% higher than the strengths specified for Works Cube Tests. If the Contractor is unable to produce specified cube strengths, he will be required at his own cost to increase the cement content of the mix until satisfactory results are produced.

The Engineer may require at any time during the contract the proportions of fine to coarse aggregateto be altered in order to produce a mix of greater strength or improved workability and providingthat the total proportions of aggregate to cement remain unchanged, no claim for additional cost willbe considered.

D. **Minimum Cement Content**

Minimum Cement Content by weight to combined Concrete Class total weight of aggregate

Class 40	1 to 4.5
Class 35	1 to 5.0
Class 30	1 to 6.0
Class 25	1 to 7.0

CONCRETE WORK (Ctd).

A. **Waterproof Concrete**

Where waterproof concrete is specified, an approved water proofing additive and plastisizer are tobe added to the mixing water strictly in accordance with the manufacturer's instructions unless otherwise approved by the Engineer.

B. **Water bar**

Water bar shall be P.V.C. water bar of an approved type and shall be provided in the positions indicated on the Drawings.

Joints shall be heat welded in accordance with the manufacturer's instructions and where the water bar is to be fixed vertically, metal clips as manufactured by the supplier of the water bar or of other approved design shall be provided to suspend the water bar from the reinforcement at the spacing recommended by the manufacturer or as instructed by the Engineer.

Where waterproof concrete is used the Contractor shall adhere strictly to the position and type of construction joints as detailed on the Drawings. Any deviation from this procedure or the provision of additional construction joints will require the prior approval of the Engineer and any additional water bar so required will be at the Contractor's expense.

Formwork shall be designed with sufficient timber formers and blocking pieces to support the water bar and to ensure that it is not displaced during concreting. In the case of horizontal joints in vertical walling and similar members the formwork shall be so constructed as to permit the starter orup stand of concrete surrounding the lower half of the water bar to be poured in the same operation as the slab or other concrete from which it springs. Formwork to walls or similar members where the water bar is positioned at the base of the lift shall have sufficient openings not less than 300mm square at approximately 200mm above the level of the water bar to permit checking that the water bar is correctly positioned and not displaced during concreting.

No concreting will be permitted to portions where up stand starters form an integral pat until the formwork to the starter has been fixed and approved.

C. **Testing Equipment**

The Contractor shall provide the following equipment for carrying out control tests on the Site: -

(a) Straight edges 3 metres and 1-metre-long for testing the accuracy of the finished concrete;

(b) A glass graduated cylinder for use in the silt test for organic impurities in the sand;

(c) Slump test apparatus;

(d) Six 150mm steel cube moulds with base plates and tamping rods to B.S. 1881-24

(e) An additional set of six cube moulds will be required at the site where pre-cast concrete is manufactured.

CONCRETE WORK (Ctd).

A. **Works Cube Tests**

Works cubes are to be made at intervals as required by the Engineer in accordance with BS 8110 and the test results shall provide a continuous record of the concrete work. The cubes shall be madein approved 150mm moulds in strict accordance with the Code of Practice. Three cubes shall be made on each occasion.

Each cube shall be marked with a distinguishing number (numbers) to run consecutively and thedate, and a record shall be kept on site giving the following particulars: -

(a) Cube No.

(b) Date made

(c) Location in Work

(d) 7-day TestDate

Strength

(e) 28-day TestDate

Strength

Cubes shall be forwarded, carriage paid, to an approved Testing Authority, in time to be tested, two at 7 days and the remaining one at the discretion of the Engineer. No cube shall be dispatched within 3 days of casting.

Copies of all Works Cube Tests shall be sent direct to the Engineer by the Testing Authority and onecopy shall be retained on the Site.

If the strengths specified are not attained and maintained throughout the carrying out of the Contract, the Contractor will be required to increase the proportion of cement and/or substitute better aggregates so as to give concrete which does comply with the requirements of the Contract. The Contractor may be required to remove and replace at his own cost any concrete which fails to attain the required strength as ascertained by Works Cube Tests.

B. **Mixing and Placing of Concrete**

The concrete shall be mixed only in approved power-driven mixers of a type and capacity suitablefor the work, and in any event not smaller than 0.40/0.28 cu. metres capacity.

CONCRETE WORK (Ctd).

A. Mixing and Placing of Concrete (Ctd).

The mixer shall be equipped with an accurate water measuring device. All materials shall be thoroughly mixed dry before the water is added and the mixing of each batch shall continue for a period of not less than two minutes after the water has been added and until there is uniform distribution of the materials and the mass is uniform in colour.

The entire contents of the mixed drum shall be discharged before recharging. The volume of mixed materials shall not exceed the rated capacity of the mixer. Whenever the mixer is started, 10% extracement shall be added to the first batch and no extra payment will be made on this account.

The entire contents of the mixed drum shall be discharged before recharging. The volume of mixed materials shall not exceed the rated capacity of the mixer. Whenever the mixer is started, 10% extracement shall be added to the first batch and no extra payment will be made on this account.

As a check on concrete consistency slump tests may be carried out and shall be in accordance with B.S. 1881-24. The Contractor shall provide the necessary apparatus and carry out such tests as are required. The slump of the concrete made with the specified water content, using dry materials, shall be determined and the water to be added under wet conditions shall be so reduced as to give approximately the same slump.

The concrete shall be mixed as near to the place where it is required as is practicable, and only as much as is required for a specified section of the work shall be mixed at one time, such sectionbeing commenced and finished in one operation without delay. All concrete must be efficiently handled and used in the Works within twenty (20) minutes of mixing. It shall be discharged from the mixer direct either into receptacles or barrows and shall be distributed by approved means whichdo not cause separation or otherwise impair the quality of the concrete. Approved mechanical means of handling will be encouraged, but the use of chutes for placing concrete is subject to the prior approval of the Engineer.

Concrete shall be placed from a height not exceeding 1,500 mm directly into its permanent position and shall not be worked along the shutters to that position. Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs, beams and similar members, and shall be placed in horizontal layers not exceeding 1,500mm deep in walls and similar members.

Concrete in columns may be placed to a height of 4 metres with careful placing and vibration and satisfactory results. Where the height of the column exceeds four metres suitable openings must be left in the shutters so that this maximum lift is not exceeded.

Concrete shall be placed continuously until completion of the part of the work between construction joints as specified hereinafter or of a part of approved extent. At the completion of a specified or approved part of construction joints of the form and in the positions hereinafter specified shall be made. If stopping of concreting be unavoidable elsewhere, a construction joint shall be made where the work is stopped. A record of all such joints must be made by the Contractor and a copy suppliedto the Engineer.

Any accumulation of set concrete on the reinforcement shall be removed by wire brushing beforefurther concrete is placed.

CONCRETE WORK (Ctd).

A. **Mixing and Placing of Concrete (Ctd).**

The Contractor shall provide runways for concreting to the satisfaction of the Engineer. Under no circumstances will runways be allowed to rest on the reinforcement.

Care shall be taken that the concrete is not disturbed or subjected to vibrations and shocks during the setting period.

Mixing machines, platforms and barrows shall be clean before commencing mixing and be cleaned on every cessation of work.

Where concrete is laid on hardcore or other absorbent materials, the base shall be suitably and sufficiently wetted before the concrete is deposited.

B. **Compaction**

At all times during which concrete is being placed the Contractor shall provide adequate trained and experienced labour to ensure that the concrete is compacted in the forms to the satisfaction of the Engineer.

Concrete shall not be placed at a rate greater than will permit satisfactory compaction nor to a depth greater than 400 mm before it is compacted.

During and immediately after placing, the concrete shall be thoroughly compacted by means of continuously tamping, spading, slicing and mechanical vibration. Vibration is required for all concrete of Classes 40, 35, 30 and 25.

Care shall be taken to fill every part of the forms, to work the concrete under and around the reinforcement without displacing it and to avoid disturbing recently placed concrete which has begun to set.

Any water accumulating on the surface of newly placed concrete shall be removed and no further concrete shall be placed thereon until such water is removed.

Internal vibrators shall be of a frequency of not less than 7,000 cycles per minute and shall have a rotating eccentric weight of at least 0.50 kg., with an eccentricity of not more than 12 mm. Such vibrators shall visibly affect the concrete within a radius of 250 mm from the vibrator.

Internal vibrators shall not be inserted between layers of reinforcement less than one and one half times the diameter of the vibrators apart. Contact between vibrators and reinforcement and vibrators and formwork shall be avoided. Internal vibrators shall be inserted vertically into the concrete wherever possible at not more than 500 mm spacing and shall constantly be moved from place to place. No internal vibrator shall be permitted to remain in any one position for more than ten seconds and it shall be withdrawn very slowly from the concrete.

CONCRETE WORK (Ctd).

A. Compaction (Ctd).

In consolidating each layer of concrete, the vibrating head shall be allowed to penetrate and re-vibrate the concrete in the upper portion of the underlying layer. In the area where newly placed concrete in each layer joins previously placed concrete more than usual vibration shall be performed, the vibrator penetrating deeply at close intervals along these contacts. Layers of concrete shall not be placed until layers previously placed have been vibrated thoroughly as specified.

Vibrators shall not be used to move concrete from place to place in the formwork.

At least one internal vibrator shall be operated for every 1.5 cubic metres of concrete placed per hour and at least one spare vibrator shall be maintained on Site in case of breakdown during concreting operations.
External formwork vibrators shall be of the high frequency low amplitude type applied with the principal direction of vibration in the horizontal plane. They shall be attached directly to the forms at not more than 1,200 mm centres.

In addition to internal and external vibration the upper surface of suspended floor slabs shall be levelled by tamping or vibrating to receive finishes. Vibrating elements shall be of the low frequency high amplitude type operating at a speed of not less than 3,000 r.p.m.

B. Construction Joints

Construction joints shall be permitted only at the positions pre-determined on the Drawings or as instructed on the Site by the Engineer. In general, they shall be perpendicular to the lines of principal stress and shall be located at points of minimum shear, viz., vertically at, or near, mid-spans of slabs, ribs and beams.

Suspended concrete slabs are generally to be cast using alternate bay construction in bays not exceeding 10 metres in length. No two adjacent bays are to be cast within a minimum period of 48 hours of each other. The joints between adjacent bays are to be in positions agreed with the Engineer.

`Shrinkage' bays, extending for the full width of the building at intervals of not less than 20 metres in the length of the building, are not to be cast until 7 days or more after casting the main adjoining floor areas.

Under no circumstances shall concrete be allowed to tail off, but it shall be deposited against stopping-off boards. Where specified the 25mm deep by 3mm wide PVC/hardwood strip shall be held on the inside face of the stopping-off boards by means of 18g binding wire at 300mm centres such that when the stopping-off board’s removed the strip remains bound to concrete.

Before placing new concrete against concrete already hardened, the face of the old concrete shall be thoroughly hacked, roughened and cleaned and laitance and loose material removed therefrom, and immediately before placing the new concrete the surface shall be saturated with water. Where the top surface of the concrete is the final finished surface e.g. power float every care shall be taken that the surface is not damaged while roughening the sides.

CONCRETE WORK (Ctd).

A. Curing and Protection

Care must be taken that no concrete is allowed to become prematurely dry and the fresh concrete must be carefully protected within two hours of placing from rain, sun and wind by means of hessian sacking, polythene sheeting, or other approved means.

This protective layer and the concrete itself must be kept continuously wet for at least seven days after the concrete has been placed. The Contractor will be required to provide complete coverage of all fresh concrete for a period of 7 days. Hessian or polythene sheeting shall be in the maximum width obtainable and shall be secured against wind. The Contractor will not be permitted to use old cement bags, hessian or other material in small pieces.

Concrete in foundations and other underground work shall be protected from admixture with falling earth during and after placing.

Traffic or loading must not be allowed on the concrete until the concrete is sufficiently matured, and if no case shall traffic or loading be of such magnitude as to cause deflection or other movement in the formwork or damage to the concrete members. Where directed by the Engineer props may be required to be left in position under slabs and other members for greater periods than those specified hereafter.

B. Faulty Concrete

Any concrete which fails to comply with this Specification, or which shows signs of setting before it is placed, shall be taken out and removed from the Site. Where concrete is found to be defective after it has set, the concrete shall be cut out and replaced in accordance with the Engineer's instructions. On no account shall any faulty, honeycombed or otherwise defective concrete be repaired or patched until the Engineer has made an inspection and issued instructions for the repair. The whole of the cost whatsoever, which may be occasioned by the need to remove faulty concrete, shall be borne by the Contractor.

C. Rod Reinforcement

The steel reinforcement shall comply with the latest requirements of the following British Standards: -

Hot rolled bars for the reinforcement of concrete to B.S. 4449 (Metric units) Cold worked steel for the reinforcement of concrete to B.S. 4461 (Metric units)

The Contractor will be required to submit a test certificate of the rollings. Reinforcement shall be stored on racks above ground level. All reinforcement shall be free from loose mill scale or rust, grease, paint or other substances likely to reduce the bond between the steel and concrete.

CONCRETE WORK (Ctd).

A. Fabric Reinforcement

To be electrically cross-welded steel wire mesh reinforcement to B.S. 4483 and of the size and weight specified.

B. Fixing Rod Reinforcement

Reinforcement shall be accurately bent to the shapes and dimensions shown on the Drawings and Schedules and in accordance with B.S. 8666. Reinforcement must be cut and bent cold and no welded joints will be permitted unless so detailed.

Reinforcement shall be accurately placed in position as shown on the Drawings, and before and during concreting shall be secured against displacement by using No. 18 S.W.G. annealed binding wire or suitable clips at intersections, and shall be supported by concrete or metal supports, spacers or metal hangers to ensure the correct position and cover.

No concreting shall be commenced until the Engineer has inspected the reinforcement in position and until his approval has been obtained and the Contractor shall give two clear days notice of his intention to concrete.

The Contractor is responsible for maintaining the reinforcement in its correct position, according to the Drawings, before and during concreting. During concreting a competent steel fixer must be in attendance to adjust and correct the position of any reinforcement which may be displaced. The vibrators are not to come into contact with the reinforcement.

C. Position and Correctness of Reinforcement

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as above, it shall be the Contractor's sole responsibility to ensure that the reinforcement complies with the details on the Drawings or Schedules and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover. The Contractor will be held entirely responsible for any failure or defect in any portion of the reinforced concrete structure and including any consequent delay, claims, third party claims, etc., where it is shown that the reinforcement has not been correctly positioned or is incorrect in size or quantity with respect to the detailed Drawings or Schedules.

D. Spacer Blocks

Spacer blocks of approved size and shape made of concrete similar to that used in the surrounding construction and fixed to the reinforcement or formwork by No. 18 S.W.G. wires set into the spacer blocks or other approved means shall be provided where necessary to ensure that the requisite cover is obtained.

CONCRETE WORK (Ctd).

A. Concrete Cover to Reinforcement

Unless otherwise directed the concrete cover to rod reinforcement over main bars in any face shall be: -

Foundations against earth face 75 mm
Foundations against blinding 50 mm
Columns 40 mm
Beams 25 mm
Slabs 15 mm

B.Fixing Fabric Reinforcement

The fabric shall be free from scale, rust, grease or other substances likely to reduce the bond between the steel and the concrete and shall be laid with minimum 300mm laps and bound with No. 18 S.W.G. annealed iron wire.

C. Projecting Reinforcement

Where reinforcement projects from a concreted section of the structure and this reinforcement is expected to remain exposed for some time, it is to be coated with a cement grout to prevent rust staining on the finished concrete. This grout is to be brushed off the reinforcement prior to the continuation of concreting.

D. Fixtures

No openings, chases, holes or other voids shall be formed in the concrete without the prior approval of the Engineer. Details of any fixtures to be permanently built into the concrete including the proposed position shall be submitted to the Engineer for his approval before being placed all electrical conduits 25mm and over in diameter.

E.Chases, Holes, etc., in Concrete

The Contractor shall be responsible for the co-ordination with the Sub-Contractors for incorporating various items e.g. structural steel plates/bolts, electrical conduit, pipes, fixing blocks, chases, holes, and the like in concrete members as required and must ensure that adequate notice is given to such Sub-Contractors informing them when concrete members incorporating the above are to be poured. The Contractor shall submit full details of these items to the Engineer for approval before the work is put in hand. All fixing blocks, chases, holes, etc., to be left in the concrete shall be accurately set out and cast with the concrete. Note the setting out of such items will be carried out by the sub- contractor and the main contractor shall be responsible for ensuring that the item remains in position while concreting.

CONCRETE WORK (Ctd).

A. Position of Electrical Conduits

Unless otherwise instructed by the Engineer all electrical conduits to be positioned within the reinforced concrete shall be fixed inside the steel cages of beams and columns and between the top and bottom steel layers in slabs and similar members.

The proposed position of all electrical conduits 25mm and over in diameter which are to be enclosed in the concrete shall be shown accurately on a plan to be submitted to the Engineer, whose approval shall be obtained before any such conduit is placed.

B. Formwork

The method and system of formwork which the Contractor proposes to use shall be approved by the Engineer before construction commences. Formwork shall be substantially and rigidly constructed of timber or steel or precast concrete or other approved material.

All timber for formwork shall be good, sound, clean, sawn, well-seasoned timber, free from warps and loose knots and of scantlings sufficiently strong for their purpose to the approval of the Engineer.

C. Construction of Formwork

All formwork shall be of sufficient thickness and with joints close enough to prevent undue leakage of liquid from the concrete and fixed to proper alignment, level and plumb and supported on sufficiently strong bearers, shores, braces, plates, etc., properly held together by bolts or other fastenings to prevent displacement, vibration or movement by the weight of materials, men and plant on same and so wedged and clamped as to permit of easing and removal of the formwork without jarring the concrete. Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the Contractor shall, by consultation with the Engineer, ensure that the supporting concrete structure is capable of carrying the load and/or sufficiently propped from lower floors or portions of the frame to permit the load to be temporarily carried during construction.

Soffits shall be erected with an upward camber of 5 mm for each 5 metres of horizontal span or as directed by the Engineer.

Great care shall be taken to make and maintain all joints in the formwork as tight as possible to prevent the leakage of grout during vibration. All faulty joints shall be caulked to the Engineer's approval before concreting.

The formwork shall be sufficiently rigid to ensure that distortion or bulging occurs under the effects of vibration. If at any time the formwork is insufficiently rigid or in any way defective the Contractor shall strengthen or improve such formwork as the Engineer may direct.

All surfaces which will be in contact with concrete shall be oiled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type applied as a thin film before the reinforcement is placed. Surplus moisture shall be removed from the forms prior to placing of the concrete.

CONCRETE WORK (Ctd).

A. Construction of Formwork (Ctd)

Temporary openings shall be provided at the base of columns, wall and beam forms and at any other points where necessary to facilitate cleaning and inspection immediately before the pouring of concrete. Before the concrete is placed the shuttering shall be trued-up and any water accumulated therein shall be removed. All sawdust, chips, nails and other debris shall be washed out or otherwise removed from within the formwork. The reinforcement shall then be inspected for accuracy of fixing. Immediately before placing the concrete the formwork shall be well wetted and inspection openings shall be closed. The erection, easing, striking and removing of all formwork must be done under the personal supervision of a competent foreman, and any damage occurring through faulty formwork or its incorrect removal shall be made good by the Contractor at his own expense.

After removal of formwork, all projections, fins, etc., on the concrete surface shall be chipped off, and made good to the requirements of the Engineer. Any voids or honeycombing shall be treated as described in "Faulty Concrete".

B. Stripping Formwork

All formwork shall be removed without undue vibration or shock and without damage to the concrete. No formwork shall be removed without the prior consent of the Engineer and the minimum periods that shall elapse between the placing of the concrete and the striking of the formwork will be as follows: -

Beam sides, walls and columns (unloaded) 3 days

Slab soffits (props left under) 7 days

Beam soffits (props left under) 9 days

Removal of props (partly subject to concrete cube strength being satisfactory) to:

Slabs 21 days

Beams 21 days

If the Contractor wishes to take advantage of the shorter stripping times permitted for beam and slab soffits when props are left in place, he must so design his formwork that sufficient props as agreed with the Engineer can remain in their original positions without being moved in any way until expire of the minimum time for removal of props. Stripping and re-propping will not be permitted.

The above times may be reduced in certain circumstances, at the discretion of the Engineer, provided an approved method is adopted at the Contractor's expense to ensure that the required concrete strength is attained before the forms are stripped.

CONCRETE WORK (Ctd).

A. Supporting Props to Wall and Beam Soffits

Where directed by the Engineer supporting props to slab and beam soffits are to be left in position until completion of the whole of the reinforced concrete structure.

The props are to be the approval of the Engineer and the Contractor must submit the suggested method of propping to the Engineer prior to removal of formwork to the relevant surfaces.

B. Exposed Concrete Finishes

(a) General

The Contractor will be required, at an early stage in the Contract, to prepare samples for the approval of the Engineer of the various concrete finishes specified hereafter. Samples are to be prepared using the same materials and the same methods of construction, compaction, curing, etc., as the Contractor proposes to use for executing the full quantity of the work.

A record of the mix, water content, method of compaction, any additives used, etc., is to be kept for each sample prepared. When the Engineer has approved a sample it will be kept on Site in approved location. The finishes in construction will be expected to be up to a standard equal to the approved sample. The Contractor is to include for all costs in preparing samples in his rates for the respective finish.

Consistency in cement and colour, grading and quality of aggregates must be maintained in all finished concrete work.

(b)Tamped Finish

Areas so specified shall be finished at the time of casing with a tamped finish to the Engineer's approval, produced by an edge board. Board marks are to be made to a true pattern and will generally be at right angles to the traffic flow. Haphazard or diagonal tamping will not be accepted.

(c) Chamfers and Rebates to Exposed Concrete

Where concrete surfaces are to remain exposed and otherwise where specified or shown on the Drawings, rebates and chamfers are to be provided at junctions, corners, and changes in direction of concrete members.

Rebates will also be required to surrounds to chisel-dressed, brushed, or similar concrete finishes.

Rebates and chamfers are to have a fair face finish.

Unless otherwise instructed, concrete pours to columns and to other members where applicable are to terminate only at the pre-determined rebate positions.

CONCRETE WORK (Ctd).

A. Exposed Concrete Finishes (Ctd)

(d) Fair Face

Fair face surfaces shall be clean, smooth, even, true to form, line and level, and free from all board marks, joint marks, honeycombing, pitting, and other blemishes. Forms are to be provided with a smooth lining of plywood, steel, or other approved material which will achieve the required finish without any general rubbing down. Rubbing down will only be permitted to remove any projecting fins at corners or joints.

(e) Chisel Dressed Finish

Chisel-dressed finish may be carried out on any grade of concrete but not until it is at least 30 days old.

The surfaces are to be fully chisel-dressed to remove a maximum of 15mm (average 9mm) of the surface by shearing and exposing the aggregate without excessive cracking of the surrounding matrix.

Arises of columns, beams, etc., are pre-formed fair face with timber set in the formwork and care must be taken in working up to these to preserve a clean line.

For vertical walls and columns particular care must be taken to remove all sharp projections. For beam soffits this requirement is not necessary.

All surfaces requiring this treatment are to have the margins chisel-dressed by hand for a minimum width of 75mm commencing from the fillet edge. Thereafter mechanical chisel- dressing may be used but the Contractor must ensure that a uniform texture and even plane surface is achieved.

The use of sharply pointed steel tools for both hand and mechanical chisel-dressing is essential. Upon completion the surfaces are to be thoroughly wire brushed and washed down.

B. Protection of Finishes

Wherever possible, in-situ exposed concrete finishes should be commenced at the highest level and worked progressively down the building.

Precautions shall be taken to avoid staining or discolouring of previously finished concrete faces by leakage of grout from newly placed concrete. The Contractor shall during all stages of construction adequately protect all concrete finishes from damage by leaking grout, knocking, paint stains, falling plaster, etc. In cases of balustrade walls to staircases and members where damage is otherwise likely, concrete finishes shall be protected by cladding with timber, softboard, or other approved sheeting. All Sub-Contractors shall be informed accordingly on the precautions to be taken.

CONCRETE WORK (Ctd).

A. Joggle Joints

Construction joints in basement walls and where specified elsewhere are to be joggle joints to the dimensions shown on the Drawings, unless directed otherwise by the Engineer.

Before pouring concrete to the adjoining areas beyond the joint, the flat surfaces on each side of the recess are to be thoroughly hacked to remove all laitance and loose concrete and washed with water. Before formwork on the second side is placed, a layer of bitumen Type 7, 30 to 40 mm thick is to be applied by trowel to the faces of the recess. This bitumen layer is to be protected by a covering strip of 1000-gauge polythene which is to be removed immediately before pouring concrete. At horizontal joints a layer of cement/sand grout 50 mm thick and of the same proportion as the cement and sand in the surrounding concrete is to be applied to the joint surface immediately before pouring concrete.

B. Precast Concrete

All materials (including fixings), workmanship, production, transport, storage, handling, erection methods and protection from damage shall comply with B.S. C.P. 110, except where inconsistent with this Specification.

Should the Contractor wish to make greater use of precast concrete construction either in the main structural frame or in cladding units than the present design permits, he may propose alternative forms of construction which will be given due consideration by the Engineer.

Finishes generally shall be as already described.

Where production of precast concrete units is to be carried out elsewhere than the main building site, the precasting yard shall be considered as part of the main building site in as far as this Specification is concerned.

The maximum size of coarse aggregate in precast concrete shall not exceed 20mm except for thicknesses less than 75 mm where it shall not exceed 10mm.

The compacting of precast concrete shall conform with requirements given elsewhere in this Specification except for thin slabs where use of immersion type vibrators is not practicable. The concrete in these slabs may be consolidated on a vibrating table or by any other methods approved by the Engineer.

Steam curing of precast concrete will be permitted. The procedure for steam curing shall be subject to the approval of the Engineer.

CONCRETE WORK (Ctd).

A. Precast Concrete (Ctd).

The precast work shall be made under cover and shall remain under the same for seven days. During this period and for a further seven days the concrete shall be shielded by sacking or other approved material kept constantly wet. It shall then be stacked in the open for at least a further seven days to season before being set in position. Where steam curing is used these times may be reduced subject to the approval of the Engineer.

Precast concrete units shall be constructed in individual forms. The method of handling the precast concrete units after casting, during curing and during transport and erection shall be subject to the approval of the Engineer, providing that such approval shall not relieve the Contractor of responsibility for damage to precast concrete units resulting from careless handling.

Repair of damage to the precast concrete units, except for minor abrasions of the edges which will not impair the installation and/or appearance of the units, will not be permitted and the damaged units shall be replaced by the Contractor at his own expense.

Except where precast work is described as "fair face" the moulds shall be made of suitably strong sawn timber true in form to the shapes required. Unless otherwise described faces are to be left rough from the sawn moulds.

Where precast work is described as fair face the moulds are to be made of metal or are to have metal or plywood linings or are to be other approved moulds which will produce a smooth dense fair face to the finished concrete suitable to receive a painted finish direct and free from all shutter marks, holes, pittances, etc.

The precast units shall be installed to the lines, gradients and dimensions shown on the Drawings or as directed by the Engineer.

CONCRETE WORK (Ctd).

A. Concrete Surface Beds

The concrete shall be placed as soon as possible after being mixed. In transporting the concrete adequate precautions shall be taken to avoid damage to the prepared base. The concrete shall be spread to such a thickness that when compacted it shall have the finished thickness as specified or shown on the Drawings. A layer of concrete 50 mm (or as specified on the drawing) less than the finished thickness shall first be spread and struck off at the correct level to receive the top fabric reinforcement. The top layer shall then be added. Not more than 30 minutes shall elapse between spreading the bottom layer and the start of compaction of the top layer.

The Contractor must ensure that the reinforcement is held rigidly in position to provide the required cover shown on the drawings. A system of stools/chairs formed with 12mm ms rod placed on a grid of 1m x 1m on levelled concrete pads shall be acceptable to hold the reinforcement in place.

The compacting and finishing of the concrete shall be effected by immersion vibrators and a hand or mechanical tamper weighing not less than 10 kg. per linear metre and having a tamping edge with a steel strip 75 mm wide fixed to the tamper by countersunk screws. Immersion vibrators with "spade" attachments will be permitted. Compaction shall be continued until a dense, scaled surface finish is achieved. Over-compaction causing an excessive amount of fines to be brought to the surface shall be avoided.

The surfaces of the concrete shall be finished to a wood float finish or as otherwise directed to the levels, falls and cross falls as directed or shown on the Drawings and shall be subject to the following tolerances: -

1. The level shall be within + or - 6 mm of the levels directed.
2. The falls shall be within 10% of the falls directed.
3. The smoothness shall be such that departures from a 3 metre straight edge laid in any direction shall not exceed 3mm.

Minor irregularities shall be made good by the use of a steel float but in no circumstances shall mortar be used to make good the surface.

Where specified, before the concrete has finally set and after completion of the floating the concrete shall be brushed with a strong headed broom to produce a grooved finish in parallel lines to the satisfaction of the Engineer. As soon as the surface has been finished it shall be protected against too-rapid drying by means of damp hessian, polythene sheeting or other approved means placed carefully on the surface and kept damp and in position for 7 days and the concrete shall be kept wet for a further 21 days. The most critical period is the first 24 hours after placing and the curing during that time shall be very thorough. The Contractor is to obtain the Engineer's approval to the material and method he proposes to use for curing and no concreting will be permitted until sufficient such material is on Site.

CONCRETE WORK (Ctd).

A. Concrete Surface Beds (Ctd).

Forms shall not be removed from freshly placed concrete until it is at least 24 hours old. Care shall be taken that in their removal no damage is done to the concrete, but should any damage occur the Contractor shall be responsible for making it good.

Where the surface bed is specified to be cast in panels, these shall in NO circumstances exceed 36 sq. metres in area and no dimension shall exceed 6 metres. The slabs shall be cast in chequer-board fashion.

Slabs for vehicular traffic, finished "off the beam" shall be solidly laid and tamped with a beam 50 mm wide with the lines of the beam to the top surface of slab diagonal to any fall.

Brushed concrete surface, where specified, shall be achieved by the following operation. While still green, the concrete is to have dry cement and sand (1:3) sprinkled on and the surface dragged with a coarse broom adding water as necessary and as directed by the Engineer. All rates must include this type of finish.

B. 50 mm Thick Topping in Concrete Slab

The topping concrete which shall not be less than 50mm thick shall consist of the following mix: 1 x 50kg bag Ordinary Portland Cement

75kg washed river sand, complying with B.S. EN 12620.

150kg washed 12mm (1/2") maximum size aggregate of approved grading and of spherical shape.

Application of plasticiser to be carried out in accordance with the manufacturers specifications and to the Engineers approval. The dosage of the additive shall be to the Engineer’s approval

20 litres of clean water to be adjusted as necessary by the Engineer to allow for the water content in the aggregates, but to be the minimum necessary to achieve workability.

The surface should be further treated with a hardener and approved dust proofing agent to manufacturers specification where specified to the Engineers approval. The dosage of the hardener shall be to the Engineer’s approval

The screed shall be compacted by tamping and the surface finish shall be formed with a steel float to give a smooth even level surface. Trowelling shall be the absolute minimum to achieve this and any overworking of the surface shall be avoided.

At joints the top 12mm of hardboard including the timber fillets shall be out after 21 days from the pouring, and the groove filled with "mastic" sealant or an alternative approved by the Engineer. The level of the top of the sealer shall be proud of the concrete surface by approximately 3mm.

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CONCRETE WORK (Ctd).

A. Power Float Concreting

The procedure is as described under item 2.52 above except use mechanical/power operated steel float instead of wood or hand steel float to manufacturer's specification and to the approval of the Engineer.

B. Saw Cuts in the Topping

Where saw cuts are specified to form construction joints these shall be carried out within 3-days (or as directed by the Engineer) of pouring concrete. The saw cuts shall be formed using power disc saw at locations shown on the drawings and the distance between the saw-cuts shall not be more 6.0m in either direction. The cuts shall be minimum 25mm deep and filled with approved industrial grade mastic sealant.

C. Notes Concerning Pricing

The Contractor must allow for all costs incurred during the progress of the Contract for complying with the provisions concerning the preparation and use of graded mixes.

Prices for plain or reinforced concrete shall include for mixing, hoisting, depositing, compacting, curing and protection at the various levels required throughout the building, and shall also include for forming or hacking a satisfactory key for all faces receiving asphalt and plaster work. Prices for slabs shall include for forming construction joints at bay edges, including all necessary temporary formwork and supplying records of such joints to the Engineer.

Prices for steel rod reinforcement shall include for cutting to lengths and all labour in bending and cranking, forming hooked ends, handling, hoisting and fixing in position and for providing all necessary tying wire, spacer blocks and supports. Prices for fabric reinforcement shall include for all straight cutting and waste, handling hoisting and fixing in position, providing all necessary tying wire, and supports and all extra material in laps. The prices for formwork shall include for extra material at joints, extra labour and waste for narrow widths, small quantities, overlaps, passings at angles, straight cutting and waste, splayed edges, notchings, etc., and for fixing at the various levels including battens, struts, and supports and for bolting, wedging, easing, striking and removal. Prices for linear items such as boxings shall include for angles and ends.

Prices of all precast concrete shall include for all moulds, finishings, as described, handling, reinforcement, hoisting and fixing at the required levels and for casting or cutting to the exact lengths required and any waste resulting from such cutting.

Prices for expansion joints shall include for cutting to size and all temporary supports and prices for expansion joint sealers shall include for all temporary battens or fillets required to form the necessary grooves.

The price for wrought formwork shall include for fair face finish either by rubbing down or by smooth lining, all as described in this Specification.

WALLING

A. Setting Out

The Contractor shall provide all necessary equipment and materials to accurately set out and shown the proper positions and levels of all openings, apertures, sills and lintels and shall build the various foundations, piers, walls, etc., to the correct thickness, widths, heights and other dimensions shown on the Drawings. Accurate setting out to approved methods will also apply in respect of other sundry works. The Contractor should include for all setting out and building to correct dimensions as shown on the Drawings or otherwise instructed by the Engineer in his rates quoted for building and other sundry work items.

B. Cement

The cement shall be as described in "Concrete Work"

C. Sand

The sand for mortars shall conform to B.S. EN 13139.

D. Lime

The lime shall be as described under "Plasterwork"

E. Mortars

Cement mortar shall consist of one part of cement to four parts of sand by volume.

Cement/lime mortar shall consist of one part of cement, one part of lime and six parts of sand by volume.

The ingredients of mortar shall be measured in proper gauge boxes on a boarded platform, the ingredients being thoroughly mixed dry, and again whilst adding water. In the case of cement/lime mortar, the sand and lime shall be mixed first and then the cement added. All mortar is to be thoroughly mixed to a uniform consistency with only sufficient water to obtain a plastic condition suitable for trowelling. No mortar that has commenced to set is to be used or remixed for use.

F. Concrete Blockwork

Concrete blocks shall be hollow or solid complying with B.S. EN 771-3 Type 'A', of minimum crushing strength 3.5 N/mm2, unless shown otherwise, and must be obtained from an approved manufacturer, equal to samples deposited with and approved by the Engineer.

All concrete blocks must be cured for a minimum period of four weeks before use and all testing of blocks is to be carried out by an approved Materials Testing Laboratory or other approved laboratory and shall be at the Contractor's expense.

WALLING (Ctd)

A. Concrete Blockwork

All blocks shall be handled and stacked with care. The blocks shall be stacked protected from rain by a cover and in such a way that air circulates around them. No broken block or block of improper quality shall be used.

All blockwork shall be bonded, pointed and uniformly bedded in true horizontal course in cement mortar and built true to line and profile. Blockwork shall be carried up evenly and in regular stages and no part shall be raised more than 1 metre above any other part of the work at any time. All blocks shall be well soaked before use and the top of unfinished walls wetted and raked back before work is recommenced. All blockwork shall be built with vertical joints staggered such that no joint in any one course shall be within 112 mm of a similar joint in the course immediately above or below.

All perpends, reveals, quoins and other angles and joints of the walls etc., shall be built strictly true and square.

Blockwork which is not to be rendered shall be finished with a fair face and the blocks shall be selected for even texture and unmarked faces, regular shape and square, unbroken arises. The blockwork shall be pointed as the work proceeds with a neat joint as required by the Engineer's Representative. Where blockwork is to be rendered the joint shall be raked out 12 mm deep as the work proceeds to form an adequate key. Blockwork shall be bonded to concrete columns and walls including portal frame legs by approved galvanised metal ties cast into the concrete, spaced at alternate courses and extending not less than 150 mm into the block joints.

Chases shall be cut as necessary for services but no excessive cutting will be permitted. Chases shall be made good after the erection of services by building in pieces of block or mortar.

B. Stone Walling

Stone for walling, piers, stacks, etc., throughout shall be obtained from a quarry approved by the Engineer and shall be free of soft or decomposed matter, fractures and other defects. It shall be laid on its natural bed, properly lapped and bonded. All stone work shall be thoroughly wetted before laying and walling shall be thoroughly wetted after laying for at least 3 (three) days.

C. Wall Reinforcement

70, 90 and 140 mm Stone and concrete block walls are to be reinforced with long lengths of 20 mm wide hoop iron x 20 gauge which is to be lapped and hooked at joints, one strand to alternate courses. In the event that hoop iron is not available, then 8 gauge high strain fencing wire may be used, one strand to 70 and 90 mm walls and 2 strands to 140 mm walls.

D. Damp-proof Courses

Damp-proof courses shall be bituminous felt to B.S. 8215 weighting 3.85 kg. per square meter, free from tears and holes and be laid with 150 mm minimum laps on and including a levelling screed of cement mortar.

WALLING (Ctd)

A. Water Proofing Membrane

Water proofing membrane where specified shall be applied as per the Manufacturers specification. The Contractor shall be required to provide a certificate of compliance to the specification necessary and guarantee from the manufacturers or approved dealers.

B. Prices to Include

The prices for walling shall include for all reinforcement, straight cutting, bonding, plumbing angles, forming reveals, pinning up to underside of concrete soffits and cutting up to sides columns and pinning ends of lintels and sills.

ASPHALT WORK

A. APP ROOFING MEMBRANE

.01 Generally

The Contractor's attention is drawn to section J of the standard method of measurement.

All work relating to APP roofing membrane shall be executed by a Specialist firm to be approved by the Architect.

The Contractor shall obtain from the approved Sub-Contractor a written guarantee and undertaking that during a period of Ten (10) Years from the date of Practical Completion as certified, the Sub-Contractor shall make good at his own cost any defects that appear in the roofing works and are due to poor workmanship or inappropriate materials. The certificate of guarantee must be duly registered as a binding legal document at the Contractors own expense.

The Attactic Poly-Propylene (APP) roofing membrane shall be supplied in strict compliance with the manufacturer's printed instructions.

.02 Application of Roofing Membrane

.01 A site survey before application is recommended to determine the general conditions to the deck and necessary preliminary work to be carried out.

.02 All angles and corners should be rounded off, bumps possibly flattened and holes filled and levelled, blisters, if any, should be cross cut and patched.

.03 Remove all nails, stones and any other object, then sweep off all dust, debris and dirt from the deck.

.04 Brush the primer all over the surface with particular care around the perimeter and the base of all raised elements, then let the primer dry well.

.05 Align rolls with 100mm (4") side overlap, starting from the drain towards the roof centre.

.06 Re-roll and then torch apply with a 150mm (6") overlap and make sure each sheet is carefully bonded for 1m at both ends. This also applies in off-set spot bond or loose laid system to avoid any possible unpredictable of the polyester mat.

ROOFING

A. Generally

Tiles shall be supplied by an approved firm. Samples of tiles must be submitted and the Architect's written approval obtained before work is commenced.

B. Roofing Sheets and Accessories

Roofing sheets shall be 24-gauge roof sheets or other equal and approved. The roof sheets shall comply with the relevant Kenya Bureau of Standards (KBS) code for roof sheets. The accessories (ridge/hip caps, flashings etc) shall all match the roof sheets in thickness, colour, profiles etc. The sheets and accessories shall all be fixed in accordance with the Manufacturer's printed instructions and Architect's satisfaction.

C. Tiling Battens

Tiling battens shall be of the timber as specified for carpentry treated with wood preservative and complying with B.S. 5534.

D. Workmanship

Tiles shall be properly stacked on wood strips and straw on level ground. Tiling shall be close joined with the horizontal and vertical joints ranging perfectly straight. Each course shall be laid flat on the previous course and properly bonded.

E. Staining

Staining of the roof when fixing ridges and hips or by other operation under the Contract must be avoided. Allow for protecting the roof with tarpaulins and polythene sheeting as necessary and for removing such stains or replacing affected work as directed on completion.

CARPENTRY

A. All Timber

All timber shall be in accordance with the latest approved Grading Rules issued by the Government of the Republic of Kenya. Timber for Carpentry shall be SECOND (OR SELECT) GRADE and timber for joinery shall be FIRST (OR PRIME) GRADE.

B. Generally

All timber as it arrives on the Site shall be inspected by the Contractor and any timber brought on the Site and not complying with the Specification or not approved, must be removed forthwith from the Site and only timber as approved shall be used in the Works.

The Contractor shall upon signing the Contract purchase sufficient supplies of specified softwoods to avoid possible shortages at a later date.

C. Species of Timber

The following timber shall be used as later described

Standard Common Name	Botanical Name
Cypress - from plantation forests (preferably Forest Standard-ship Certificate (FSI)	Cypressus

D. Tolerances in Thickness

Shall conform with the following extracts of Government of Kenya Grading Rules: -

(1) Hardwood Grading (First and Second Grades)

The following tolerances in thickness will be admitted: -

(a) 1.5mm oversize on pieces up to 25mm in thickness

(b) 3mm oversize on pieces over 25mm and up to 50mm in thickness.

(c) 6mm oversize on pieces over 50mm in thickness.

Undersize timber will not be permitted.
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CARPENTRY (Ctd)

A. Tolerances in Thickness (Ctd).

(2) Softwood Grading: Strength Grades (for Carpentry) First and Second Grades.

Undersize not allowed.
Oversize: All timber to be sawn oversize by 1.5mm per 25mm of thickness and width to a maximum of 3mm in thickness and 6mm in width.

(3) Softwood Grading: Appearance Grades (for Joinery) First and Second Grades.

All as for Strength Grades above.

B. Insect Damage

All timber shall be free from live borer beetles or other insect attack when brought upon the Site. The Contractor shall be responsible up to the end of the maintenance period for executing at his own cost all work necessary to eradicate insect attack to timber which becomes evident, including the replacement of timber attacked or suspected of being attacked, notwithstanding that the timber concerned may have already been inspected and passed as fit for use.

C. Seasoning of Timber

All timber shall be seasoned to a moisture content of not more than 22% for Carpentry and 15% for Joinery.

D. Pressure Impregnation Treatment

All Carpentry timbers, sawn joinery and timber grounds for fixing joinery shall be treated with pressure impregnated treatment solution with a minimum net retention of 0.35 Ibs. of dry salt per cubic foot. If so required "charge sheets" issued after treatment shall be submitted by the Contractor to the Architect for his retention. All cut ends and any other cut faces of timbers sawn after treatment shall be treated before fixing with treatment solution brushed on.
The Contractor's prices for such timber hereinafter must allow for the above treatment.

CARPENTRY (Ctd).

A. Inspection and Testing

The Architect shall be given facilities for inspection of all works in progress whether in workshop or on Site. The Contractor is to allow for testing of prototypes of special construction units and the Architect shall be at liberty to select any samples he may require for the purpose of testing, i.e. for moisture content, or identification, species, strength, etc.; such tests will be carried out by an approved Testing Laboratory.

B. Clearing Up

The Contractor is to clear out and destroy or remove all cut ends, shavings and other wood waste from all parts of the building and the Site generally, as the work progresses and at the conclusion of the work.

This is to prevent accidental borer infestation and to discourage termites and decay.

C. Workmanship

All Carpenter's work shall be accurately set out in strict accordance with the Drawings and shall be framed together and securely fixed in the best possible manner with properly made joints; all brads, nails and screws, etc., shall be provided as necessary, directed and approved, and the Contractor's prices shall allow for all the foregoing.

All workmanship shall be of the best quality.

All Carpenter's work shall be left with sawn surfaces except where particularly specified to be wrought.

D. Dimensions

Dimensions of timber for Carpentry left with sawn faces shall comply with the previous Clause specifying tolerances in thickness. Dimensions for wrought members shall be as described in "Joinery".

E. Jointing

All timber shall be as long as possible and practicable to eliminate joints. Where joints are unavoidable surfaces shall be in contact over the whole area of the joint before fastenings are applied.

No nails, screws, or bolts are to be fixed in any split end. If splitting is likely, or is encountered in the course of any work, holes for nails are to be prebored at diameters not exceeding $4/5^{th}$ of the diameter of the nails. Clenched nails must be bent at right angles to the grain.

Lead holes are to be bored for all screws. When the use of bolts is specified the holes are to be bored from both sides of the timber and are to be of the diameter D D/16, where D is the diameter of the bolt. Nuts must be brought up tight but care is to be taken to avoid crushing of the timber under the washers.

JOINERY

A. All Timber

All timber shall be FIRST (OR PRIME) Grade. Species of timber and tolerance shall be defined under "Carpentry".

B. Generally

All joiner's work shall be accurately set out on boards to full size for the information and guidance of the artisans before commencing the respective works, with all joints, iron work and other works connected therewith fully delineated. Such setting out must be submitted to the Architect and approved before such respective works are commenced.

All joiner's work shall be cut out and framed together as soon after the commencement of the building as is practicable, but not to be wedged up or glued until the building is ready for fixing same. Any portions that warp, wind or develop shakes or other defects within six months after completion of the works shall be removed and new fixed in their place together with all other work which may be affected thereby, all at the Contractor's own expense.

All work shall be properly mortised, tenoned, housed, shouldered, dovetailed, notched, pinned, braded, etc. as directed and to the satisfaction of the Architect and all properly glued up with the best quality glue.

Joints in joinery must be as specified or detailed, and so designed and secured as to resist or compensate for any stresses to which they may be subjected. All nails, springs, etc, are to be punched and puttied. Loose joints are to be made where provision must be made for shrinkage, glued joints where shrinkage need not to be considered and where sealed joints are required. Glued for load bearing joints or where conditions may be guaranteed casein or organic glues may be used.

All exposed surfaces of joinery work shall be wrought and all arises "eased off" by planning and sand- papering to an approved finish suitable to the specified treatment.

C. Insect Damage

All timber shall be free of insect damage as defined under "Carpentry".

D. Seasoning of Timber

All timber shall be seasoned to a moisture content of not more than 15%.

E. Dimensions

3mm Reduction off specified sizes will be allowed to each wrought face except where described as finished sizes in which joinery shall hold up to the full dimensions.

JOINERY (Ctd.)

Dimensions (Ctd.)

The Contractor is to note that all joinery timber sizes are normal unless otherwise stated as finished sizes. These nominal sizes have been calculated in accordance with Standard Method of Measurement of Building Works, January 1987 2nd Edition Metric and no regard has been taken of metric sizes of timber at present being sold.

A. Fixing Joinery

All beads, fillets and small members shall be fixed with round or oval brads or nails well punched in and stopped. All larger members shall be fixed with screws. Brass screws shall be used for fixing of all timber, the heads let in and pelleted over with wood pellets to match the grain.

B. Bedding Frames etc.

The Contractor's rates must include for bedding frames, sills etc., in mortar or dressing surfaces of walls, etc., in lieu.

C. Plugging Concrete and Walls

Round wood plugs shall not be used. All work described as plugged shall be fixed with screws to plugs formed by drilling concrete walls etc. With a proper tool of suitable size at 750mm spacing and filling the holes completely with approved rawl plastic or Rawplugs in accordance with the Manufacturer's instructions. Alternatively, and where so agreed by the Architect hardwood dovetailed fixing slips, dipped in approved treatment solution and cut and pinned or bedded in cement mortar (1:3) may be used.

D. **Fibreboard:** Shall be 12mm termite-proofed softboard cut to panels with V-edges.

E. **Plywood:** Shall comply with B.S. 6566 (First Quality "interior type" unless otherwise specified).

F. **Blockboard:** Shall be laminated board faced both sides with 4mm plywood. Exposed edges shall be lipped with 20mm softwood and rates shall include for lipping.

G. **Plastic Sheeting:** Shall be "Formica" sheeting 1/16" thick and securely fixed with approved type waterproof adhesive and in the colours approved by the Architect.

JOINERY (Ctd.)

A. **Chipboard**: Shall be resin bonded and shall comply with B.S. EN 312.

B. Protect Joinery

Any fixed joinery which in the opinion of the Architect is liable to become bruised or damaged in any way, shall be completely cased and protected by the Contractor until the completion of the Works.

C. Flush Doors

All flush doors shall be manufactured to the thickness specified and consist of 100mm wide framing all round with horizontal core battens at not more than 75mm centres pressure impregnated as describedand bored with 12mm diameter ventilation holes at 300mm centres. Doors shall have two lock blocks and be faced both sides with approved veneer and have 25mm softwood rebated lipping all round and otherwise be equal to an approved sample. External flush doors shall be as described above but faced both sides with "exterior" quality plywood. Doors should also receive stiffening/blocking for UNON- PACT Access Control System Electronic Locking System.

D. Prices to Include

Prices of items hereafter shall include for the foregoing labours etc., and in addition all prices for linear items are to include all internal and external angles, either mitred or tongued all fair, fitted, stopped, notched or returned ends all similar incidental labours and all short lengths.

E. Bottom Edges

Bottom edges of doors shall be painted with one coat of approved primer before fixing.

F. Ironmongery

All locks and ironmongery shall be fixed with screws etc. to match. Before the woodwork is painted, handles shall be removed carefully stored and re-fixed after completion of painting and locks oiled and left in perfect working order. All keys shall be labelled with the door reference marked on labels before handing to the Architect on completion.

UNON-PACT Access Control Locking & Electronic Card Readers shall be fixed by UNON Specialist Contractor to conduited & cabled outlets provided under this Contract to Specialist Contractor's layout and requirements. Provide attendance on specialist installers.

SPECIFICATIONS

4/40

METAL WORK

A. All Materials

Shall be of the best quality, free from defects. The materials in all stages of transportation, handling and piling shall be kept clean and injury from breaking, bending and distortion prevented.

B. Nails, Screws and Bolts

Shall be of the best quality mild steel of lengths and weights approved by the Architect. Nails shall be to B.S. 1202-1 and bolts to B.S. 916.

C. Workmanship

All work shall be carried out in the most workmanlike manner and strictly as directed by the Architect.
Welding shall be neatly cleaned off and units shall be prefabricated in the workshop wherever possible, the minimum of site welding being employed.
All screwed work shall have full internal and external threads and holes shall have been cleaned off. Counter sinkings must be concentric.

D. Rainwater Goods

Prices shall include for building in, casting in or cutting mortices for fastenings, all making good, jointing, short lengths and all extra joints in the case of fittings.

E. Louvre Clips

Shall be approved of steel, aluminium-lacquered, single control type, unless otherwise described, carefully screwed into timber sub-frames or plugged and screwed to walling.

Prices shall include for oiling and adjusting and leaving clean and undamaged on completion.

F. Fixing Metal Windows

The Contractor's prices for fixing metal windows, doors etc. shall include for assembling and fixing, cutting mortices for lugs in concrete or walling and running with cement mortar (1:4), bedding frames in similar mortar and pointing in mastic, bedding cills, transomes and mullions in mastic, making good plaster around frames both sides and fixing, oiling and adjusting all fittings.

G. Mild Steel

For balustrades etc. shall comply with B.S. 15 No work shall be fabricated until site dimensions have been checked and no additional claim will be accepted should final dimensions differ from those on the drawings.

METAL WORK (Ctd.)

G. Mild Steel (Ctd.)

All welds shall be ground smooth and the Contractor shall ensure that the metalwork is prepared for painting as described in painting and decorating.

The Contractor is to ensure that all work is erected plumb and true and be so maintained until properly secured by permanent fixings.

H. Structural Hollow Sections

All hollow sections are to be connected by electric welding or butt welds the fusion surfaces of each member must be properly aligned and prepared.

J. Electronic Welding

All welding is to be in accordance with the requirements of B.S. 499-1 and the electrodes shall comply with B.S. EN 60974-6

Fusion faces shall be free from irregularities which could interfere with the welding material. Those faces also be free from any deletions matter such as rust, grease and paint.

All welds shall be prepared by planning or machine flame cutting. During welding all parts will be maintained in their correct position.

Welds shall be carried out with each run closely following the one prior with sufficient time between to allow for removal of slag.

Each run of weld is to be inspected and the Sub-Contractor shall ensure that unsatisfactory welds are cut out or remade to the required standard.

The minimum size of fillet weld shall be 6mm.

All completed welds shall have a regular and smooth surface. The weld material shall be solid complete fusion throughout the weld and to the forecut metals.

Any defects shall be cut out or made good to approval. External faces of butt welds to be ground smooth.

K. Painting

All steel is to be wire brushed and any loose scale, dirt or grease shall be removed before any painting is commenced. One coat of red oxide primer type A B.S. 2523 shall be applied at the shop.

Any damaged to priming paint shall be made good to the Architect’s satisfaction.

SPECIFICATIONS

4/42

STRUCTURAL STEELWORK

A. Quality of Materials and Workmanship

The quality of all materials and workmanship used in the execution of this Contract shall comply with the requirements of the most recent issues of the following British Standards and Codes of practice, including all amendments to date of calling for Tenders.

BS. 4 (Pt.1) - Hot Rolled Sections
BS. EN 10210-2 - Hot Rolled Hollow Sections
BS. 5950-1 - The use of Structural Steel in Building
BS. EN 60974-1 - Arc welding plant, equipment and accessories
BS. EN 60974-6 - Covered Electrodes for the manual Arc Welding of Mild steel and medium tensile steel
BS. 916 - Black bolts, screws and nuts.
BS.1449-1 (Pt. 1) - Steel plate, sheet and strip.
BS. 6323-1 - Steel tubes for Mechanical, Structural and General Engineering purposes.
BS. En 10162 - Cold Rolled Steel Sections.
BS.4190 - ISO metric black hexagon bolts, screws and nuts. BS.4320 - Metal washers for general engineering purposes BS. EN 10210-1 - Weldable structural steel.
BS. EN 10210-2 - Hot rolled structural steel sections.
BS. 4872-1 - Approval testing of welders when welding procedure approval is not required
BS. EN 1011-2 - General requirements for the Metal Arc Welding of structural steel.
BS.5493 - Protection of iron and steel structures from corrosion.

The Engineer may at any time require any materials to be tested in accordance with the requirements of the Standards listed above. The cost of all successful tests shall be borne by the Client, but the Sub-contractor shall if required promptly supply at his own expense test pieces as required by the Engineer. The costs of tests on materials failing to comply with this Standard shall be borne by the Sub-contractor. If in the opinion of the Engineer, faulty materials and/or workmanship have been used in the works, the Sub-contractor may be directed to dismantle and cut out the parts concerned and remove them for examination and testing. The cost of dismantling, cutting out and making good to the approval of the Engineer shall be borne by the Sub-contractor.

B. Fabrication

(a) Cutting and Bending

All members, plates, brackets, etc., shall be neatly and accurately sheared, sawn or profiled to the required shape as shown on the drawings. Where steel is oxy-cut to shape, care shall be taken to preserve the full finished sizes required. If members or plates are bent or set, the bends or sets shall be correctly made to the radii or angles specified without leaving hammer marks. The material may be heated to permit this. Material that has been heated shall be annealed to approval.

STRUCTURAL STEELWORK (Ctd)

A. Fabrication (Ctd)

(b) Punching and Drilling

Holes for black bolts shall be drilled or punched 2mm larger in diameter that the bolt used. Hole for high tensile friction grip bolts shall be drilled or sub-punched and reamed to 2mm larger in diameter than the specified bolts size. All drilled holes shall be parallel sided and shall be drilled with the axis of the holes perpendicular to the surface, badly drilled holes shall either be reamed out to approval and larger bolts fitted or otherwise as directed. All rough arises shall be ground off. Holes for bolts in material thicker than 15mm must be drilled. When holes are drilled in one operation through to or more thickness of material, the parts shall be separated after drilling and all burrs removed before assembly. Holes for bolts shall not be formed by a gas cutting process.

All members shall be fabricated with a tolerance in length of +0mm and -3mm, all shall not deviate from straightness by more than 1 in 400.

The allowance for angular twist shall be (3+0.6L) mm where L is the length of the member under consideration in meters. Twist shall be measured by placing the member as fabricated against a flat surface measuring the difference between the two corners of the apposite end. The above tolerance shall be adhered to unless otherwise specified to the Engineer's drawing.

B. Fastening

Bolting & Screwing

All bolts used shall be such length that at least one full thread is exposed beyond the nut after the nut has been tightened. Where a nut or bolt head would bear on an inclined surface, a bevelled washer of the correct shape shall be interposed between the two surfaces. Bevelled washers shall not be allowed to get out of position during fabrication and erection and for this purpose may be spot welded to the steel surface. Bevelled washers for use with high tensile bolts may not be welded.

Black bolts, nuts and washers, shall comply with the requirements of BS.916 or alternatively BS.4190 ISO metric black hexagonal bolts screws and nuts.

Self Drilling Screw; All self drilling screws used shall be of such length that at least one full thread is exposed beyond the purlin. The self drilling screws should be correctly driven (not under or over driven) such that the rubber seal should be in line with the underside with the hexagonal head.

All self drilling screws must have a corrosion resistance tested to a requirement of al least 1000 hours as per AS 3566 clause 3 or equivalent British Standard.

High tensile bolts, nuts and washers, friction grip bolts.

All high tensile steel bolts, nuts and washers used in joints shall comply with the requirements of BS.4882 and shall be used in accordance with BS.4882

STRUCTURAL STEELWORK (Ctd)

A. Bolting Screws (Ctd)

Pressed steel purlins

Pressed or cold rolled steel purlins and girts shall be to the sizes indicated on the drawings and shall be formed from approved steel strip with a minimum yield strength of 185N/sq.mm.

The sections shall be manufacture straight and free from twist, the tolerance away from straightness shall not be greater than 2mm for every 1.500mm in length along any folded edge.

B. Electric Welding

All welding shall be carried out in strict accordance with the requirements of BS.499-1 and electrodes shall comply with BS. EN 60974-6.

Fusion faces shall be free from irregularities such as tears, fins etc., which would interfere with the deposition of weld metal.

Fusion faces shall be smooth and uniform and shall be free from loose scale, slag, rust, grease, paint and/or other deleterious material.

All welds shall be of acceptable types, shall be of the finished sizes specified, and shall be carried out in such sequence that minimum distortion of the parts welded results.

Preparation of edges for welding shall be carried out by planning or machine flame cutting. Manual flame cutting may be permitted in certain circumstances.

Parts to be welded shall be maintained in their correct relative positions during welding, preferably by jigs.

Multiple run welds shall be carried out with each run closely following the previous run but allowing sufficient time for the proper removal of slag.

The Sub-contractor shall ensure that each run is inspected and unsatisfactorily weld cut out and remade to approval.

Welds in material 25mm or greater in thickness shall be made by the Argon Arc or similar approved process, and special precautions shall be taken to prevent weld cracking.

Unless otherwise shown, the minimum size of fillet shall be 6mm.

On completion, welds shall present a smooth and regular finish. Weld metal should be solid throughout with complete fusion between weld metal and parent metal and between successive runs throughout the joint.

Defects shall be cut out and made good to approval in sound weld metal.

The external faces of butt welds are to be ground smooth on completion and to be to the approval of the Engineer.

STRUCTURAL STEELWORK (Ctd)

A. Shops and Field Connections

Rolled Sections

All shop connections shall be electric welded or bolted with high tensile friction grip bolts.
No bolts used shall be less than 12mm diameter and no weld less than 40mm in length. At least two bolts shall be used in connections transmitting loads unless indicated by the Engineer.
No weld of length less than four times the nominal fillet size shall be deemed capable of carrying a load.
Beam to column connections not detailed shall be on "standard" top and bottom cleat connections with the load carried on the bottom cleat. "Standard web connections shall be used for connecting beams to beams.
Field connections shall be as detailed, i.e. bolted with high tensile or black bolts in drilled holes. Black bolts in punched holes will only be permitted for connections carrying a designed load for or for connections to timber members.

B. Structural Hollow sections – Circular and Rectangular

Hollow sections shall be connected by electric welding unless shown otherwise.

The design of welds shall be in accordance with Clause and 54 and Appendix C of BS.449.

C. Trusses and Portal Frames

Trusses shall be carefully set out to the dimensions shown on the drawings.

Where it is required that trusses be cambered, such camber shall be provided by bending the bottom chord to the arc of a circle.

Notwithstanding any dimensioned spacing of purlin cleats, the Sub-contractor shall ensure that purlin cleat spacing is satisfactorily for the available stock lengths of roof sheeting. However, the Engineer's approval must first be obtained before any alteration is made in purlin spacing or sheeting sizes.
Splices in portal and other frames shall be made where shown on the details.

D. Boxed Members

Abutting edges of boxed members shall be connected and scaled with a continuous weld to exclude the entrance of moisture. Where specified such welds shall be ground flush to approval.

STRUCTURAL STEELWORK (Ctd)

A. Shop Assembly

Such assembly of units in the shop as is specified or necessary before transporting to the site will be inspected by the Engineer before painting. The work will be laid out in the shop are yard so that all parts are accessible for inspection and testing of the work.

The Sub-contractor shall furnish all facilities for inspection and testing of the work and he must notify the Engineer on each occasion when the material is ready for inspection.

B. Marking

All members of the structure to be site assembled shall be match marked in accordance with the shop details and marking plans submitted for approval.

C. Erection

Site Dimensions

No erection shall commence before accurate site dimension have been taken by the Sub-contractor, and no claim will be considered should final dimensions differ from those on the drawings. Any modifications to the structural steel required in order to comply with site dimensions shall be made on the ground to the Engineer's approval before erection is commenced.

General Setting Out-Tolerances

The temporary Bench Mark (TBM) which shall be located at the structural ground floor level (S.G.F.L) having been agreed on site between Architect, Engineer and Main Contractor, shall be considered as the site datum.

The datum points for the setting out of the datum lines passing through the T.B.M at all floor and roof levels; +/-0m.

The permissible Deviation (P.D) from the T.B.M and D.L shall be as follows: -

a) Setting out on plan at S.G.F.L.

All setting out dimensions with respect to each datum line (i.e. P.D from "x" and " y" plane axes)

+/-10mm per 30 meters.

STRUCTURAL STEELWORK (Ctd)

A. Erection (Ctd)

General Setting Out-Tolerances (Ctd)

b) Transfer of T.B.M to Structural first floor, Intermediate floors and roof levels.

With respect to the T.B.M at S.G.F/L the T.B.M at:

First Floor Level +/-5mm Intermediate Floor Levels+/-10mm Roof Level +/-15mm

c) Setting out on plan of upper floors with respect to the Transferred T.B.M.

All setting out of dimensions with respect of each datum line+/- 10mm per 30 meters.

1120111 relevant T.B.M of the upper or lower surface of any truss or element, taking into account specified chambers. +/-10mm.

f) The plumb vertical members +/10mm per storey.

All erection shall be carried out by competent and experienced men and the Sub-contractor shall take every care to safeguard the public, workmen and adjoining property.

All gear used shall be of adequate strength and shall comply with all regulations current at the time.

The subcontractor shall be held responsible for all damage caused to the structure, workmen or buildings erection.

B. Storing and Handling

Steel shall be stored and handled and erected in such a manner that no member is subjected to excessive stresses which could have an adverse effect on the properties of the steel. If in the opinion of the Engineer, the steelwork has been subjected to such treatment, and Contractor shall remove this steel from the site and replace it as his own expense.

STRUCTURAL STEELWORK (Ctd)

A. Erection Details

No member or part of a member which has been bent or distorted shall be erected in that condition. All straightening shall be done on the ground.

Columns shall be wedged to line and level on steel or castiron wedges and checked by the Engineer. After acceptance, column bases shall be grouted to approval before wedges are removed. Unless shown on the drawing, all columns shall be left truly vertical and correct to line and level. Beams, girts, etc., shall be erected. level unless otherwise shown and correctly positioned.

Trusses and open web joists shall be carefully handled at all times and when being erected shall be lifted at such points and in such a manner as will preclude any possibility of damage from erection stresses. Immediately after erection, each truss shall be made secure by purlins, bracing or guys to approval. Bracing shall be placed in position as soon as dependent work will permit.

B. Field Connections

In making connections, drifting of unfair holes will not be permitted and holes not matching properly shall either be reamed or drilled out and a larger bolt inserted or otherwise as directed. Holes formed or enlarged by oxy-cutting will be condemned and must be filled to approval by electric welding and red drilled.

C. Tightening and Testing High Tensile Friction Grip Bolts

Before assembly, the contact surface, including those adjacent to the washers, shall be de-scaled or carry normal tight mill scale. They shall be free from dirt, oil, loose scale, burrs, paint (except priming paint) pits and other defects that would prevent solid seating of the parts.

Bolts shall be assembled with approved hardened flat or tapered washers as required between the bolt head and nut and the softer mild steel.

When bearing faces of the bolted parts have a slope of more that 1 in 20 with respect to a plane normal to the bolt axis, square smooth bevelled washers shall be used to compensate for the lack of parallelism.All bolts shall be tightened by the "Turn of Nut" method. This method shall generally be as approved by the Engineer to achieve in all bolts a minimum tension equal to the proof load.

D. Grouting

Unless otherwise detailed on the drawings, a space of not less than twenty (20) mm and not more than forty (40) mm shall be provided between undersides of column base plates and footings, and between all beam and roof truss bearings and concrete pads, etc.

STRUCTURAL STEELWORK (Ctd)

A. Grouting (Ctd)

After each column, beam, or roof truss has been wedged up to a true line and level and fixed in position to approval, the space between footing or pad and the underside of the baseplate or steel member shall be grouted with a mixture of Portland cement and approved washed sand.

The Portland Cement and sand shall be thoroughly mixed to approval in equal proportion by volume with only sufficient water to procedure a mixture of "damp earth" consistency and shall be used within twenty minutes of mixing. The Caulking mixture shall be packed to approval into the space between baseplate and foundation and protected from damage until set.

B. Painting

Paints

All paints are to be supplied by supplier approved in writing by the Engineer.

Paints are to be delivered to the site or the Structural Contractor's works in the original containers as supplied by the manufacturers with seals unbroken and are to be used in strict accordance with the manufacturer's instructions. Manufacturer's representatives are to be free to visit the site and inspect materials and workmanship, and if necessary take samples of materials for laboratory analysis.

Paints are not to be thinned unless instructed by the Engineer.

No external painting is to be carried out during rain or when rain is likely to occur before the paint has had time to dry. All surfaces are to be dry and free from moisture at the time of paintings.

All structural steel shall be thoroughly scraped and wire brushed to remove mill scale and rust. Dirt and grease or oil shall be washed off with white spirit and the steel allowed to dry.

Painting

A first coat of Zinc Chromate Primer shall be applied in the works immediately the steel preparation has been completed. A minimum of 24 hours shall elapse before the steel is moved from its position whilst painting has been carried out. After delivery to site, the steel shall be carefully examined and all areas where the priming coat has been damaged and/or where rust has developed shall be washed with white spirit and wire brushed as necessary and a further priming coat as for the first applied to completely cover the damaged areas.

During erection, surface of steel which are to be in contact, shall be painted with one further coat of primer as previously described and the surface brought together whilst the paint is still wet. described for Structural Steelwork.

SPECIFICATIONS

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STRUCTURAL STEELWORK (Ctd)

A. Painting (Ctd)

Bolts, Nuts, Washers, etc., shall after erection is completed to approval, be carefully degreased with white spirit and painted as for steelwork.

Steel purlins and sheeting rails shall generally be painted as for steelwork except for purlins and rails supporting aluminium sheeting when the following specification shall be used.

1st coat - Red Oxide Zinc Chromate Primer 2nd coat - An approved Aluminium paint

The interiors of mild steel gutters shall be prepared as previously described for Structural Steelwork.

B. Prices, Measures and Payment

Prices quoted by the Contractor shall be based on the calculated weights of steel and shall include for manufacture, painting and supply all as specified and as shown on the drawings, including the cost of delivery to the site or other agreed place or places and the supply of all bolts, rivets, plugs, gussets, cleats, stiffeners etc to complete the erection of the works. Note where member overall size is specified and thickness or weight per unit length is not specified or clear take the minimum size specified in relevant British Standard for sections (refer pg 1) but shall not have less than 3mm wall, flange or web thickness.

Prices shall include for erection (all labour, scaffolding, and other erection equipment necessary) and cover the cost or additional prime coat painting as previously specified. The prices shall also include for lining up, levelling and plumbing, but not for grouting up of the bases.

The basis for payment for steelwork shall be the calculated steel weights of the structure. Any variation from the original design on which the quotation was made, which results in either an increase or decrease in calculated weight of the structure as completed, shall result in the appropriate additions or deductions to the agreed quotation.

Any written instructions from the Engineer which may result in additional work over and above that for which the Contractor quoted will be considered as extras and shall be paid for on the basis of calculated additional steel weights.

C. Roof Sheeting

Roof sheeting and wall cladding shall comply with BS CP 143 and shall be capable of spanning 1.425m under a load of its own weight and an applied load of 0.25kN/m2. Defective sheets shall not be used.

STRUCTURAL STEELWORK (Ctd)

A. Rain Water Goods

Rain water goods shall be in accordance with BS.460. It shall be as per the details shown in the drawings and as per the direction of the Engineer. Rain water gutter and pipes shall be made out of steel sheets of the required thickness.

B. Fixing

Sheeting and Rain water goods shall be fixed in accordance with BS.494-1. IT4 sheets, ridges, flashing sheets shall be fixed by skilled men as per standard procedure with sufficient number of bolts, washers and laid out properly on the roof so that there shall be no leakage of water during rains. Rain water gutter, pipes etc. shall be fixed properly with necessary accessories to avoid any leakage of rainwater.

C. Translucent Sheets

Translucent sheets shall be from standard manufacturer approved by the Engineer. These sheets shall have profile to match the rest of pre painted steel sheets on the roof. Skilled men shall be employed for fixing the sheets. Proper fixing of the edges of translucent sheets with the edges of steel sheet should ensure no leakage during rains. Defective sheet shall not be used and if formed after laying, such sheets should be replaced by goods sheets.

D. Composite IT4/LT5 Sheets with Insulation

Shall be formed with 2 Nos. IT4/LT5 sheets kept 50mm apart by 20-gauge (or as specified on the drawings) Galvanised Iron (girth =150mm) spacer cold formed into channel. The spacers are at the same centres as the purlins i.e. 1.425m centres unless stated otherwise by the Engineer. The insulation shall be mineral fibre 50mm thick packed and sealed in 1000g polythene bags of size convenient to handle and laid over the lower sheet. The connection between the sheet and ms purlin and with GI spacer shall be with J Bolts or self drilling roof screws.

E. Inspection & Approvals

The Contractor shall submit to the Engineer shop/fabrication drawings (showing general arrangements, connection details i.e. plates, welds, bolts, bolt holes, sleeves, etc) for approval and shall not commence any fabrication before the shop drawings are approved. The Contractor shall give the Engineer 5 (five) working days to comment /approve the drawings. The contractor shall give the Engineer at least 48hr notice to inspect any part of the work either in the yard or on site, this time shall be doubled if the site is more than 100 km from the nearest permanent office of the Engineer.

PLASTERWORK AND OTHER FINISHES

A. Cement

The cement shall be previously described in “Concrete Work”.

B. Sand

The sand shall be as described for fine aggregate but that for plastering shall be light in colour and well graded to a suitable fineness in accordance with the nature of the work in order to obtain the finish directed.

C. Lime

The lime for plastering shall comply with B.S. EN 459-1 Class “A” for non-hydraulic lime and shall be as rich as obtained and to approval. It must be freshly burnt and shall be slaked at least on month before being used by drenching with water, well broken up and mixed and the wet mixture shall be passed through a sieve of two meshes per square millimeter. Lime putty shall consist of freshly slaked lime as above described, saturated with water until semi-fluid and passed through a fine sieve; it shall then be allowed to stand until superflous water has evaporated and it has become of the consistency of thick paste, in no case for a shorter period than one month before being used during which it must be kept damp and clean and no portion of it allowed to become dry.

Alternatively, hydrated lime with 70% average calcium oxide content may be used and it must be protected from damp until required for use. It shall be soaked to putty at least 24 hours before use.

D. Composition of Plasters, etc.

A mix referred to, as 1:4 shall mean 40 Kg. of cement and 0.10 cubic metres of sand. All other mixes shall be construed in a like manner.

E. Hacking, etc.

The prices for all pavings and plastering, etc. shall include for hacking concrete surfaces and for raking out joints of walls 12mm deep and for cross-scoring undercoats to form a proper key.

Plastering on walls generally shall be taken to include flush faces of lintels, beams etc. in same.

PLASTERWORK AND OTHER FINISHES (Ctd.)

A. Surfaces

All surfaces to be paved or plastered must be brushed clean and well wetted before each coat is applied. All cement pavings and plaster shall be kept continually damp in the interval between application of coats and for seven days after the application of the final coat.

B. Dubbing Out

Where required shall be composed of one-part cement to six parts of sand.

C. Partially Set Mixes

Partially or wholly set materials will not be allowed to be used or re-mixed. The plaster etc mixes must be used within two hours of being combined with water.

D. Samples

The Contractor shall prepare samples of the screeds, pavings and plastering as directed until the quality, texture and finish required is obtained and approved by the Architect, after which all work executed shall confirm with the respective approved samples.

E. Finish Generally

All screeds, pavings etc. shall be finished smooth even and truly level unless otherwise specified by the whatever method the Contractor thinks fit excepting screeds, pavings etc. to receive vinyl tiles which shall be steel troweled.

Rendering and plastering shall be finished plumb, square, smooth, hard and even and junctions between surfaces shall be perfectly true, straight and square.

All work shall be to approval and any not complying with the above shall be hacked away and replaced at the Contractor’s expense.

F. Arrises and Angles

All arrises and angles shall be clean and sharp or slightly rounded or thumb covered as directed, including neatly forming mitres.

PLASTERWORK AND OTHER FINISHES (Ctd.)

A. Making Good

All making good shall be cut out to a rectangular shape, the edges undercut to form dovetail key and finished flush with face of surrounding paving or plaster. Cut out and make good all cracks blisters and other defects and leave the whole of the work perfect on completion.

B. Prices to Include

In addition to the foregoing prices of superficial items are to include for work in narrow widths all linear labours angles and arrises all fair edges for making good up to or stopping a line at the required level at top of skirtings or dados where directed and for making good up to windows, door frames and similar.
The prices for all linear items unless otherwise measured are to include for all short lengths, angles and arrises, mitres and ends of every description.

C. Prices for Paving

Prices for pavings, screeds etc. are to include for adequate covering and protection during the progress of the Works to ensure that the floors are handed over in perfect condition on completion.

D. Floor Screeds

Floor screed shall be composed of green or red-coloured cement and sand (1:2) and shall not be laid in areas exceeding ten square metres during any period of 24 hours. As bays are formed steel edge strips must be used to retain the exposed edge of the screed.

E. Two-Coat Lime Plastering

Lime plastering shall consist of a first coat in cement, lime and sand (1:2:9) and a finishing coat of lime putty skim with 10% cement added. The two coats shall have total finished thickness of not less than 15mm on walls and on 10mm total thickness on concrete soffits, beams, edges etc.

The first coat shall be trowelled to a perfectly true and even surface and finished with a wood float, the surface being sprinkled with water from a brush during the process and before it has set thoroughly scratched to form a key. The finishing coat shall not be less than 1.5mm thick, thoroughly worked with a steel trowel sprinkled with water as before and be brought to a uniform smooth and hard surface.

PLASTERWORK AND OTHER FINISHES (Ctd.)

A. White Glazed Wall Tiles

White glazed wall tiles shall be of local manufacture size 150 x 150 x 6mm thick, with associated fittings all to B.S. EN 14411. Tiles shall be well soaked in water, laid with straight horizontal and vertical joints on and including cement and sand (1:4) screed 10mm thick bedded in cement mortar (1:3) pointed in white cement and cleaned down on completion, all to approval.

Rates for linear items shall include for all special fittings and cutting at angles and intersections.

B. Granolithic Paving

The granolithic shall consist of one-part cement (by volume) to two and a half parts (by volume) of local granite chippings graded from 6mm down to 3mm with not more than 15% to pass a No. 50 B.S. sieve.

Granolithic shall be spread and given only sufficient trowelling to produce a perfectly level surface immediately after laying. When the granolithic has stiffened sufficiently so that a hard surface can be obtained without laitance then the surface shall be polished with a steel float to a perfectly even and smooth surface. On no account will dusting with neat cement to the surface be permitted.

C. Polished Terrazzo

Polished terrazzo shall consist of a screed or backing coat and a finishing coat of "Snowcrete" and marble chippings (1:2) mixed with "Cementone No. 1" colouring compound in accordance with manufacturer's instructions. Overall thickness are to be as later specified.

The finishing coat shall be a minimum of 12mm thick for paving and 9mm thick for wall finishes, trowelled to a smooth and even finish and well rubbed and polished with carborundum. The finished texture and colour shall be similar to a sample approved by the Architect.

PLASTERWORK AND OTHER FINISHES (Ctd.)

A. Plasterboard Ceilings

Plasterboard Ceiling linings shall be of an approved plasterboard ceiling lining. The boards shall be of the thickness stated in the Bills of Quantities and shall consist of an aerated or formed gypsum core encased in and firmly bonded to specially prepared durable paper.

The plasterboard shall be fixed to galvanized mild steel metal studs of at least 0.5mm minimum thickness and from approved Manufacturer. All accessories including fibre tapes, finishing compounds corner beads etc. shall be provided.

The plasterboards, metal studs and suspension system shall all be fixed in accordance with the Manufacturer's printed instructions.

B. Decorative Plaster

External rendered surfaces shall generally be finished in factory manufactured decorative plaster to thickness stated in the Bills of Quantities. The materials and method of application shall all be specified in the Manufacturer's printed specifications and catalogues all as specified in the schedule of finishes. The address for the supplier is to be provided by the Tenderer

C. Porcelain Floor Tiles

Porcelain floor tiles shall be from an approved European Manufacturer. The tiles shall be of regular pattern and thickness. The tiles shall be laid with approved adhesives.

D. Floor Tile Adhesive Application and Tile Laying

1. Substrates must be sound, free from oil, grease and sufficiently dry. Cementitious substrates must be cured.
2. Wipe the back side of tiles with water if dusty.
3. Mix adhesive according to manufacturer's specifications.
4. Allow to stand for 5-10 minutes to mature. After remixing, the paste is ready for application.
5. To ensure good adhesion first apply a thin coat on the substrate with the flat side of the trowel, then notch with the toothed side of the trowel.
6. Spread the adhesive mortar onto the substrate with a notched trowel, using a handing angle of 45-60 degrees, to a maximum surface area of 2 sm. Ensure trowel notch size is appropriate for the tile dimension. (see table below).

PLASTERWORK AND OTHER FINISHES (Ctd.)

Floor Tile Adhesive Application and Tile Laying (Ctd.)

7. When laying tiles of over 400 x400, the bed mortar is applied with a notched trowel as usual. In addition, just before laying the tiles, a thin layer of mortar is applied to the backside of the tiles.

8. The tiles are then laid by pressing and making small rotation movements to ensure that the glue gets in total contact with both surfaces.

9. Additionally, the tiles should be fixed with the help of a rubber hammer in order to increase the holding power and spread of the mortar under the tile being levelled.

10. Observe construction joints (expansion, contraction, fraction, perimeter and corner joints) and the joints between concrete slab pours.

11. Joints should be a minimum of 3mm, and grouting should take place after a minimum of 48 hours.

12. On floor areas of over 30 sm, leave partition joints to be filled with flexible material, like grey silicone. These should be a maximum of 6 metres apart.

13. Always allow a free perimeter expansion joint of a minimum of 3mm between the floor and the wall or column, hidden by a skirting.

KALEKIM 1052 RECOMMENDED NOTCHED TROWEL SIZES

Up to 100 x100 tiles	U4 (4x4)
Up to 200 x200 tiles	U6(6x6)
Up to 400 x400 tiles	U8 (8x8)
Greater than 400 x400 tiles	U10 (10x10)

PEGACOL RECOMMENDED NOTCHED TROWEL SIZES

Up to 100 x100 tiles	U4 (4x4)
Up to 450 x450 tiles	U6(6x6)
Up to 900 x900 tiles	U6(6x6) or U9 (9x9)
Greater than 900 x900 tiles	U9 (9x9)

E. **Protection**

The Contractor’s rates for all finishings shall allow for adequate protection against damage by all following trades or any other cause to the satisfaction of the Architect.

PAINTING AND DECORATING

A. Approved Specialist

All work under this trade must be executed by an approved Specialist unless the Architect agrees otherwise.

B. Generally

The Contractor shall also arrange his programme of work that all other trades are complete and away from the area to be painted when painting begins. Before painting the Contractor must remove all concrete mortar dropping and the like from all work to be decorated and remove all stains from and obtain uniform colour to work to be oiled and polished.

All plaster, metal, wood or other surfaces which are to receive finishes or paint, stain, polish, distemper or paint work or any description are to be carefully inspected by the Contractor before he allows any of his painters to commence work. The Contractor will be held solely responsible for all defective work condemned as a result of his Painter's failure to insist on receiving from the other trades surfaces in proper condition to allow first class finishes of the various kinds specified being applied to them.

C. Painting Generally,

All materials are to be of the best quality and to Architect's approval.

All materials to be applied externally shall be of exterior quality and/or recommended by the Manufacturers for external use.

All materials shall be delivered on Site intact in the original sealed drums or tins and shall be mixed and applied strictly in accordance with Manufacturer's instructions and to the approval of the Architect.

Unless specially instructed or approved by the Architect no paints distemper, etc. are to be thinned or otherwise adulterated but are to be used as supplied by the Manufacturers and direct from the tins.

If required by the Architect the Contractor is to provide at his own expense samples of paints etc. with containers and cases to be forwarded carriage paid by the Contractor for analysis to a laboratory.

SPECIFICATIONS
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PAINTING AND DECORATING (Ctd.)

Painting Generally (Ctd.)

The priming undercoats and finishing coats shall each be of differing tints and the priming and undercoat shall be the correct brands and tints to suit the respective finishing coats in accordance with the Manufacturer's instructions. All finishings coats shall be of colours and tints selected by the Architect. Each coat must be approved by the Architect before the next coat is applied.

Each coat shall be properly dry and in the case of oil or enamel paints shall be well rubbed down with fine glass paper before the next coat is applied. The paintwork shall be finished smooth and free from brush marks.

Colour cards of all paints etc. shall be submitted to and samples prepared for approval of the Architect before laying on, and such samples when approved shall become the standard for work.

All paints, emulsion paints and distempers shall be applied by means of a brush or spray gun or rollers of an approved type where so agreed by the Architect.

No painting is to be done in wet weather or on surfaces which are not thoroughly dry.

Prices of paint, distemper, etc. shall include for preparation of surfaces rubbing down between each coat, stooping, knotting, etc., and all other work in connection and as described and as necessary to obtain a first class and proper finish to approval.

Emulsion paint on ceiling and all undercoats of emulsion paint and complete oil painting on walls shall be completed before flooring are laid. Final coats of emulsion paints on walls shall be applied after such flooring has been laid complete.

A. Samples

The Contractor shall furnish at the earliest possible opportunity before work commences and at his own cost samples of painting for the Architect's approval and any further samples in the case of rejection until such samples are approved by the Architect and such samples when approved shall be a minimum standard for the work to which they apply.

The Architect may reject any materials or workmanship not in his opinion up to the approval sample and these must be removed from the site without delay.

PAINTING AND DECORATING (Ctd.)

A. Preparation and Priming of plaster etc., surfaces

Plaster surfaces shall be perfectly smooth free from defects and ready for decoration. All such surfaces shall be allowed to dry for a minimum period of six weeks, stopped with approved plaster stooping compound and rubbed down flush as necessary and then be thoroughly brushed down and left free from all efflorescence, dirt and dust immediately prior to decorating.

Plaster surfaces which are to be finished with emulsion oil or enamel paint shall be primed with an approved primer and applied in accordance with the Manufacturer's instructions.

B. Preparation and Priming of Fibreboard

Fibreboard or similar surfaces shall be lightly brushed down to remove all dirt, dust and loose particles and have all nail holes or other defects stopped with an approved plaster stopping compound rubbed down flush and left with a texture to match surrounding material and shall receive one coat primer at last.

C. Preparation and Priming of Metalwork

All surfaces shall be thoroughly brushed down with wire brushes and scraped where necessary to remove all scale rust etc., immediately prior to decorating and given one coat of red oxide primer. Where severe rust exists and if approved by the Architect a proprietary de-rusting solution may be used in accordance with the Manufacturer's instructions.
Galvanized surfaces shall be treated before painting with a solution of calcium plumbate, applied in strict accordance with the Manufacturer's printed instructions or with an approved calcium plumbate primer.

Coated surfaces already treated with bituminous solution shall be scraped to remove soft parts and then receive two isolating coats of aluminium primer or other approved anti-tar primer.

D. Preparation and Priming Woodwork

All woodwork shall be rubbed down, all knots covered with a thick coat of good shellac or aluminium knotting primed with one coat of approved ready-mixed proprietary wood primer and all cracks, nail holes, defects and uneven surfaces etc. stooped and faced up with hard stopping rubbed down flush. Plywood shall be brushed filled over the entire surface.

Woodwork to receive finishes other than paint shall have all stains removed, be well rubbed down and have all defects levelled with hard stopping of a colour to match the adjoining surface.
SPECIFICATIONS
4/61

PAINTING AND DECORATING (Ctd.)

A. Existing Painted and Decorated Surfaces

In addition to the preparation described above existing painted plaster, metal or wood etc., surfaces shall be rubbed down to expose the material beneath and old paint burnt off with blow torches if necessary in the Architect's opinion.

B. Wood Preservative

All woodwork in contact with walling or plaster shall be treated after cutting and preparation but before assembly or fixing with one coat of approved wood preservative to Architect's approval.

C. Wax Polish

Wax polish shall be furniture polish of an approved brand and wood surfaces shall be clean, smooth, and free from oil or grease or any other blemishes. A minimum of two coats shall be applied to Architect's approval.

D. Cement Paint

Shall be to Architect's approval. Two coats shall be applied after preparation as specified above.

E. Emulsion Paint

Emulsion paint shall be to Architects approved. After preparation as specified above a minimum of three coats shall be applied using a thinning medium of water only if and as recommended by the Manufacturer.
An approval plaster primer tinted to match may be submitted for the first coat.

F. Enamel Paint on Metalwork and Woodwork

Enamel paint shall be to Architect's approval. Apply one undercoat and two finishing coats, after preparation and priming as specified above.

G. Ironmongery

Where instructed, all ironmongery shall be removed from joinery, steel windows and louvres before painting is commenced, and shall be cleaned and renovated if necessary and refixed after completion of painting.

H. Painting Items

Painting items are billed hereafter shall include for preparing and priming surfaces as above described.

I. Cover Up

Cover up all floors, fittings etc. with dustsheets when executing all painting and decorating work.

J. Clean and Touch Up

Paint splashes, spots and stains shall be removed from floors, woodwork etc. any damaged surfaces touched up and the whole of the work left clean and perfect upon completion.

SPECIFICATIONS

4/62

G L A Z I N G

A. Glass

All glass shall comply with B.S. 952-2 free from flaws, bubbles, specks and other imperfections. All glass shall be delivered in proper container with maker's name guarantee, type of glass and thickness or weight of glass attached to the outside of the containers.

Glass panes shall be cut to sizes to fit the openings with not more than 1.50mm play all round and where puttied shall be sprigged to wood or clipped to metal frames.

Clear sheet glass shall be ordinary glazing (O.Q.) quality. Polished plated glass shall be G.G. quality. Obscured glass shall be roughcast plain rolled glass 4mm thick.

Wired glass shall be polished Georgian wired glass 6mm thick.

B. Beads and Washleather

The glass to doors and screens and other places where vibration may occur shall be bedded in washleather with beads and fixed with brass cups and screws.

The timber rebates shall be cleaned, primed and painted with one coat of oil paint.

C. Bedding Strips

Shall be of plastic or washleather approved by the Architect and shall be cut to fit exactly the line of frame and beads.

D. On Completion

Remove all broken, scratched or cracked panes and replace with new to the satisfaction of the Architect. Clean inside and out with an approved cleaner. On no account shall windows be cleaned by scraping with glass.

E. Mirrors

Mirrors are to be selected quality clear plate of float glass to B.S. 952-2 with plain polished edges unless otherwise specified. The mirrors shall be tropicalized to the approval of the Architect. All mirrors shall be pre-drilled for fixing screws and shall be free from all flaws and imperfections.

MECHANICAL ENGINEERING INSTALLATIONS

Mechanical Engineering Installations shall be carried out in accordance with the appended Specifications for Mechanical Engineering Services prepared by the Mechanical Engineer and shall be carried out by approved Domestic Sub-Contractors. The Works generally includes plumbing, drainage and firefighting installations, air conditioning and mechanical ventilation installation.

The Main Contractor shall arrange and monitor programme for the work of the Sub-Contractor and for all other Sub-Contracts affected by them including the Electrical Installations Sub-Contract. The Main Contractor shall ensure that all work and Builder's Work in connection is carried out in a sequence which will allow under-floor drains, piping in ducts, chases and the like leading to or from all sanitary fittings, hot or cold water tanks, gulley traps, vent pipes and the nearest manholes to be installed in their correct positions in order to minimize the amount of cutting of holes, chases, floor ducts, etc as much as possible.

The Main Contractor shall carry out the builder's work in connection with the Sub-contract including cutting or forming holes and chases and later making good.

SPECIFICATIONS
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ELECTRICAL INSTALLATIONS

The Electrical Installation work shall be executed by an approved nominated Sub-Contractor in accordance with appended Sub-Contract Specification prepared by the Electrical Engineers.

The Builder's Work in connection with electrical installation shall be carried out by the Main Contractor.

All necessary pipe ducts and the like shall be build in as directly by the Architect in readiness for the Electrical Sub-Contractor.

All conduits, junction boxes and other requirements shall be built into the concrete floor and roofing slabs where required and adequate notice shall be given to the Electrical Sub-Contractor and the Architect to enable these to be positioned before concreting.

SPECIFICATIONS
4/65

R O A D W O R K S

MATERIALS

A. Quality

Before any materials are incorporated in the work the Contractor shall provide test certificate which confirm that the materials comply with the requirements of this specification.

Any materials deemed to be defective shall be removed from site.

B. Cement

Cement used in the works shall be ordinary Portland Cement complying with the requirements of BS 12, unless otherwise specified or permitted by the Engineer.

The Contractor shall provide a copy of the test certificates to show that the cement has been tested, analysed and conforms with the requirements of BS 12 or the applicable standard where cement is not ordinary Portland Cement.

All cement shall be stored in a water proof shed or purpose built silo. Cement shall be stored on a raised floor at least 150mm above the surrounding ground. Each consignment of cement shall be stored separately and cement shall be used in the order of delivery. Any cement considered by the Engineer to be unsatisfactory shall be removed from site.

C. Hand Packed Stone Base Course

The rock from which the stones and screenings are to be produced shall comply with the following: -

.01 Aggregate Crushing Value – not greater than 40%
.02 Los Angles Value – not greater than 60%
.03 Sodium Sulphate Soundness Test – loss on 5 cycles to be not more than 12%

D. Granular Sub-base

These shall comprise natural lateritic gravels, quartzite gravels or weathered rock.

SPECIFICATIONS
4/66

ROADWORKS (Ctd).

MATERIALS (Ctd).

A. Granular Sub-base (Ctd).

Grading

The material on sieve analysis after compaction shall follow a smooth curve within the following range: -

Sieve mm	Percentage by Weight Passing
50 (2''9)	95-100
40 (1.5'')	80-100
28 (1'')	60-100
20 (3/4'')	35-90
10 (3/8'')	25-80
6.3 (1/4'')	12-50
2.0	10-40
1.0	7-33
0.425 (36)	4-20
0.075 (200)	

Fraction passing No. 200 sieve shall not be greater than 67% of the fraction passing No. 36.

Fraction passing No. 36 sieve shall have a Liquid Limit not greater than 25% and a Plasticity Index not greater than 15%.

C.B.R. Strength at 95% M.D.D. after 4 days soak to be not less than 30%.

Nodule Hardness shall be such that the nodules shall not crumble between the fingers.

B. Crusher Run Base Course

The materials shall be stone complying with the following requirements: -

.01 Aggregate Crushing value: Not greater than 32%

.02 Los Angeles Abrasion value: Not greater than 45%

.03 Sodium Sulphate Soundness Test: Loss on 5 cycles to be more than 12%

ROADWORKS (Ctd).

MATERIALS (Ctd).

A. Crusher Run Base Course (Ctd).

The aggregate shall consist of crushed stone which is tough and durable, roughly cubical in shape and free from excess or flat and/or elongated particles clay, top soil or other deleterious matter and shall be to the approval of the Engineer. In respect of grading the crusher-run material shall confirm to the grading requirements given in the following table: -

B.S. Sieve	Percentage Passing by Weight
2''	100
1''	75-95
3/8''	40-70
3/16''	30-60
No. 7	20-45
No. 36	15-30
No. 200 5-15	

Where the crusher-run materials is deficient in fine aggregate and in the opinion of the Engineer, the Contractor has made every reasonable effort to produce the required grading, the Engineer will allow admixing of crusher fines, or soil binder to the approval of the Engineer. No extra payment will be made for providing the mixing in of such fines.

The Crusher fines or soil binder shall have a liquid limit not greater than 20 and plasticity index not greater than 6.

The percentage of fine aggregate to be added to the crusher-run material will be decided by the Engineer.

B. Premix (Asphaltic Concrete) Wearing Course

The materials shall be stone complying with the following requirements: -

.01 The term "Premix" or "Asphaltic Concrete" shall mean mixture of dried, hot aggregate of pre-determined grading and hot straight run bitumen in pre-determined quality to give adequate strength and stability and shall apply both to the mix and the compacted layer on the road.

.02 The actual quantity of binder and the aggregate used in various proportions shall be determined by Laboratory tests and trial mixes.

ROADWORKS (Ctd).

MATERIALS (Ctd).

A. Premix (Asphaltic Concrete) Wearing Course (Ctd).

The Contractor shall be responsible for the design of the mix and shall provide the design information to the Engineer together with sample sections on the site based on the designed proportions of the aggregate and binder to the Engineer's approval.

Once the design mix has been approved it shall not be varied by the Contractor without written authority of the Engineer.

Notwithstanding the Engineer's approval the Contractor shall be responsible for compliance with the provisions of the Specification.

The material used shall comply with the following requirements: -

.01 Bitumen grade 60/70

.02 Course aggregate: -

- .01 Los Angeles Abrasion – Max. 35
- .02 Aggregate Crushing Value – Max. 28
- .03 Sodium Sulphate Soundness – Max. 12

.03 Fine aggregate: -

- .01 Sand equivalent min. 40
- .02 Sodium Sulphate Soundness – Max. 12

.04 Mineral Fillers: -

- .01 Shall be cement, lime, limestone or other mineral matter and shall be NON-LASTIC

.05 Grading: -

- .01 Passing 0.425mm 100%
- .02 Passing 0.075mm 75%

ROADWORKS (Ctd).

MATERIALS (Ctd).

A. Premix (Asphaltic Concrete) Wearing Course (Ctd).

.06 Grading: -

The mix grading shall comply with the table below: -

Sieve Size	Percentage by Weight Passing
14	100
10	90-100
6.3	62-90
4	50-80
2	35-65
1	25-50
0.425	14-33
0.300	11-27
0.150	6-27
0.075	3-8

.07 Asphalt Mix: -

The mix shall comply with the following table: -

TEST		RESULT REQUIRED
.01	Crushing Ratio	60 – 100%
.02	Marshall Stability (N) (Test) (ASTM. 1559)	5000 – 9000
.03	Flow (mm)	3 – 5
.04	Voids in total mix (%)	3 - 5

ROADWORKS (Ctd).

MATERIALS (Ctd).

A. Premix (Asphaltic Concrete) Wearing Course (Ctd).

.08 Mixing shall be carried out in an approved stationary plant at controlled temperatures as follows: -
The materials shall be mixed in such a manner that on discharge from the mixer the mixture is uniform in composition and all particles of the aggregate are completely coated. The mixing time shall be the minimum to ensure such coating and shall not exceed 90 secs. from the addition of the bitumen.

.09 When permitted by the Engineer, soil binder material may be added to screenings or used in lieu of screening, provided it complies with the following requirements: -

.01 The fraction passing BS sieve No. 200 shall be less than half that passing No. 36 sieve.

.02 The plastic index shall be not greater than 8 and preferably not greater than 5.

B. Surface Dressing Chippings

All chippings shall consist of tough durable crushed stone, approximately cubical in shape and free from visible stone dust, clay, lime matter and other deleterious matter. The rock from which the chippings are to be produced shall comply with the following: -

.01 Aggregate Crushing Value – not greater than 26%

.02 Los Angeles Abrasion Value – not greater than 40%

.03 Sodium Sulphate Soundness Test – loss on 5 cycles to be not greater than 12%.

C. Hardcore Fillings

Where the Engineer directs that an improved subgrade layer of hardcore is required, the hardcore shall be good hard stone ballast or quarry waste to the approval of the Engineer. All materials shall be broken down to pass through a 150mm diameter ring. The hardcore shall be free from all weeds, roots, vegetation, top soil, clay or other unsuitable materials. It shall be well graded with smaller stones and fine materials to give a stable, dense mass after laying. For each layer of hardcore to be compacted, sand shall be added during compaction to obtain a solid compact mass.

ROADWORKS (Ctd).

MATERIALS (Ctd).

A. **Bitumen and Bitumen Emulsion**

Before any bitumen or bitumen emulsion is delivered to the site, the Contractor shall provide the Engineer with a certificate from the Manufacturer that the material to be supplied complies in all respects to the relevant specification given or referred to hereunder: -

Any bitumen or bitumen delivered in leaking containers or deteriorated containers may be rejected. The types of bitumen binders required will normally be as follows: -

.01	Price coat	
	On stone base course	(R.C. 70 or MC 70)
	On stabilized base course	(Alternatively R.C. 1 or MC 1)
.02	Surface dressing	
	Above 2000m altitude	180/200 Penetration
	Below 2000m altitude	80/100 Penetration

B. **Pipe Culverts**

Concrete for culverts shall be 25N/mm sq. and the maximum size of aggregate shall be 12mm for pipes whose whole thickness in less than 60mm.Pipes shall have either spigot and socket or ogee joints and the wall thickness shall be in accordance with the table below: -

PIPE DIA. (INT.) mm	MIN. WALL THK.mm	SOCKET LENGTHmm	
600	60	75	
750	75	90	
900	90	90	

All pipes shall be cured for at least 7 days and protected from sun and drying winds for at least 14 days after casting. No pipe shall be used in the work until it is 21 days old.

All pipes shall be capable of supporting a test load of 2000kgs. Per metre run for 1 minute without sign of failure. This test shall be applied in accordance with B.S. 5911. A minimum of 10% of the pipes from the initial batch shall be tested and thereafter the frequency of testing shall be reduced if the Engineer is satisfied with the quality of the pipes.

ROADWORKS (Ctd).

WORKMANSHIP

A. Site Clearance

The Contractor shall remove only those trees specifically noted for removal. Care shall be taken to protect all trees which are not to be removed.

Where trees or shrubs are to be removed, the roots shall be completely removed and the holes left by the roots backfilled with approved material. The backfill shall be compacted to BS 1377-4 upto the ground level or sub-grade level.

B. Setting out of the Roadworks

The Contractor shall be responsible for setting out the whole of the works and shall advise the Engineer when the works are ready for checking and the Architect will approve the setting out within 48 hours. The setting out shall comply with the following tolerances:-

Levels – Angles –
Alignment – +10mm or 10mm in any 50mm
+ 0 degrees 20'
+10mm or 10mm in any 50mm

C. **Removal of Top Soil and Black Cotton Soil**

The surface of the formation within the limits of the excavation required for the roadworks shown on the drawings or where instructed by the Engineer and of land from which material is to be excavated for fill or for any other purpose shall be stripped of top soil to a depth below the average surface level as the Engineer may require or approve.

D. **Compaction Standard**

The standard of compaction throughout the work shall be described as in the relevant sections of BS. 1377-4, Part 4 and tested for compliance with the requirements of BS. 1377-4. Wherever the expression "%BS Compaction' is used it shall mean the standard compaction is such that the dry density of the compacted material is the required percentage of the maximum dry density ascertained from BS. 1377-4.

E. **Excavation to Formation Level**

All excavations shall be formed and completed to the correct lines and levels shown on the drawings. The Contractor shall take every care in excavating not to remove material below the required formation level unless directed by the Engineer. Any such unauthorized excavation shall be made good to the required level with approved material at the Contractor's expense. Such filling shall be laid in layers not exceeding 150mm in loose thickness and be watered and to 100% BS compaction.

SPECIFICATIONS
4/73

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Unsuitable Material in Sub-Grade

Where in the opinion of the Engineer any unsuitable material occurs in cutting the Contractor shall excavate it in depths and widths directed and replace it with approved compacted fill material.

B. Construction of Embankments and Fills

All embankment and fills shall be formed and completed to the correct lines, slopes, widths and levels shown on the drawings and with the sub-grade parallel to and at the correct depth below the profile, cambers, crossfall or super elevation shown for the finished level unless otherwise directed by the Engineer.

Where shown upon the drawings or directed by the Engineer, shoulders shall be constructed as part of the earthwork operations and paid as such.

Embankments and fills shall be construction only of material approved by the Engineer and obtained form the excavation of cutting, drains or borrow pits. Materials with very high swelling characteristics such as black cotton soil shall not be used without approval by the Engineer.

The Engineer may direct that certain soils be excluded from the sub-grade layer and other soils set apart and used only for this layer in which case the Contractor shall comply and allow in his rates for such selection of materials.

Where the scope of the existing ground is greater than 1 in 3, or where directed by the Engineer, horizontal terraces in steps not less than 3m wide shall be cut into the existing ground, before laying imported fill material.

C. Spreading and Compaction of Fills and Embankments

Embankments and fills shall be constructed in layers not exceeding 200mm in depth before compaction, parallel to the formation level and compacted throughout to a minimum density of 95% BS Compaction.

While the material is being spread and compacted it shall be graded to level and thickness with a motor grade weighing not less than 10Mg. Where water needs to be added, it shall be applied in an even manner. The rate of application shall be such that no transverse of longitudinal flow occurs.

Where directed by the Engineer that rock shall be used as filling to embankments, the rock shall be placed in the bottom of the embankment or as directed by the Engineer. The largest portions of the rock shall be placed in layers, the maximum depth of which shall be 0.5m, the interstices filled with the finer materials and spalls, and the whole layer compacted by an approved method. More fine materials and spalls shall be added and the layer again compacted until the voids are completely filled.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Spreading and Compaction of Fills and Embankments (Ctd).

Where shoulders are constructed as part of the earthwork, grips shall be but through at intervals to prevent water standing upon the sub-gate.

Should water accumulate on any part of the earthwork due to the Contractor's method of working and particularly in ruts caused by construction traffic the Engineer may order the Contractor to remove any material which has become saturated or cannot then be compacted to the required density and to replace it at his own expense.

All drains shall be maintained throughout the contract and maintenance period in proper working order.

B. **Compaction of Sub-Grade Layer**

Unless detailed to the contrary on the drawings or otherwise directed by the Engineer the upper 150mm of the sub-grade layer in both cuttings and embankments shall be compacted to a minimum density of 100% BS Compaction.

The maximum compacted thickness which shall be processed at one time shall be 150mm and if in cuttings, a greater depth is required to the top layer of materials and shall be bladed off and temporarily stock-piled while the lower layer is compacted. If layer of depth greater than 150mm is required, the top layer shall not be brought on until the lower layer is compacted. No additional payment will be made for delay in bringing on the top layer.

The layer shall be scarified and water sprayed in or the material allowed to dry out until a uniform moisture content 5% below the optimum Moisture Content for BS Compaction is achieved. The layer shall then be immediately compacted to at least 100% BS Compaction by a roller of a type and weight approved by the Engineer.

During this process the final surface shall be graded to level parallel to the crossfall, camber or profile shown upon the drawings or directed by the Engineer.

All services shall be laid prior to the road construction unless otherwise agreed in writing and all trenches adequately backfilled and compacted to the satisfaction of the Engineer.

C. Laying Granular Sub-Base

The prepared formwork shall be cleared of all foreign and loose material and any pot holes, ruts, undulations, depressions or other defects shall be corrected. If the correction work required is extensive the Engineer may require the surface to be compacted, graded and finished off true to cross section line before murram is placed.

The prepared formation shall be checked and approved by the Engineer before any material is spread.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Laying Granular Sub-Base (Ctd).

The material shall be spread uniformly to a specified thickness by a motor grader or by any other method approved by the Engineer. The material shall be thoroughly mixed to a uniform consistency. Large stones or boulders which cannot be broken down shall be removed to a spoil heap. The layer shall be of uniform grading without areas of segregation and with no pockets of fine materials. Vehicles shall not be allowed to pass over the spread layer before it has been rolled and compacted effectively for the approval of the Engineer. Immediately following the spreading of the sub-base or base material it shall be consolidated to the full width by rolling with a power roller weight at least 10 tonnes or with a vibrating roller of equivalent capacity. Controlled water spraying will be applied on the layer in order to achieve good compaction. The moisture content shall be adjusted so as to give the required density and the layer shall be compacted to 100% BS Compaction.

Rolling shall progress gradually from the sides to the centre and from one side towards previously placed material by lapping uniformly each proceeding rear-wheel track by one half the width of such track and shall continue until the entire area of the course has been rolled by the rear wheels.

Along places inaccessible to the granular sub-base shall be tamped thoroughly with mechanical or hand tampers. The level of the sub-base shall be continually checked with straight edges and camber boards.

When rolling develops irregularities greater than 10mm when measured with a 3 metre straight edge laid parallel to the reference line of the road or which exceeds 10mm when measured from a cumber board laid transverse to the reference line, or when the average compacted thickness of layer is less than surface shall be loosened and additional material of the same quality added and layer respread and compacted. In no circumstances shall screenings be used to make good depressions. When correcting irregularities in the surface, the layer shall be scarified to a depth of at least 75mm and recompacted.

B. Stock Piling of Crusher Run Material

The site of stock pile shall be levelled, graded and drained, all vegetable removed and, if necessary, the area shall be surfaced with murram or other material, all as directed by the Engineer. At least the 0.1m bottom layer shall be left behind.

After use, the stockpile area shall be cleared and left neat and tidy.

C. Mixing and Spreading of Crusher Run Material

Every reasonable effort shall be made to prevent segregation after mixing and during dumping and spreading operation.

Where the addition of fine material is necessary, it shall be thoroughly mixed in with the crusher-run aggregate before the introduction of any water that might be required.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Mixing and Spreading of Crusher Run Material (Ctd).

Water shall be added as necessary so that compaction of the spread material is carried out within the range of 2% to +1% of the optimum moisture content determined by compaction trials or by the Vibrating Hammer Method Test in BS 1377-4.

The proportioning of materials, and their subsequent mixing, shall be carried out using such methods and machines as may be approved by the Engineer.

The mixer shall have an adequate output of either the batch or continuous – mix type.

Upon completion of mixing the materials shall without delay be transported to the road and spread by a mechanical paver.

The paver shall be to the approval of the Engineer and be capable of spreading the crusher-run material in an even manner – without segregation, to a thickness sufficient to provide a compacted layer of at least 200mm over widths between 2.5 to 3.5m.

No crusher-run layer of greater compacted thickness than 200mm shall be laid and where a greater depth is required, the material shall be laid in two or more layers.

C. Compaction and Slushing of Crusher-Run

As soon as possible after spreading of the pavement layer compaction shall be carried out. During compaction, care shall be taken to maintain the moisture content evenly at the required amount. The main compaction shall be carried out with a pneumatic tyred roller weighing not less than 15Mg and/or a vibrator roller approved by the Engineer.

Compaction shall continue until:

.01 The specified number of passes of the compaction plant, as determined by compaction trials, or as specified by the Engineer, has been made or

.02 The compacted pavement layer contains not more than 5% air voids.

All rolling shall be longitudinal and shall commence at the outer edges of the road and progress towards the centre of the road except that on super elevated curves, rolling may progress from the lower to the higher edge.

The irregularities that may show up during rolling shall be corrected by loosening the surface and removing or adding material as may be required.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Compaction and Slushing of Crusher-Run (Ctd).

After the main rolling the layer shall be saturated with water, slushed and compacted with smooth steel wheeled roller weighing not less than 12Mg and/or approved vibrator roller and rolling shall continue until at excess fines have been brought to the surface and the surface shows a tightly bound mosaic of stones. Any patches of voids shall be filled loosening up the layer and grouting with screenings approved by the Engineer.

B. Drainage of Crusher Run Base

So that water passing through the layer can be allowed to drain from the sub-grade, it is essential that the grips cut through the shoulders be in full working order. Any soft sports in the sub-grade, which subsequently might appear, shall be removed together with any over-laying pavement layers and replaced with re required standard at the Contractor's expense.

C. Hand Packed Stone Base Laying and Compacting

The stones shall be laid to the approval of the Engineer to an even depth which, after compaction, will produce the specified thickness of layer. After preliminary shaping with two passes of a 21/2 tonne roller or by other approved means, each layer shall be covered with a 25mm thick layer of dry crushed stone well graded from 5mm down to dust and approved by the Engineer. This fine material shall then be vibrated approved vibrating plate compactor or other approved vibratory plant. Should hungry patches develop during compaction additional fine material as above shall be applied and compaction of the whole surface continued until no more can be taken in. Once this stage of compaction is reached the layer shall be rolled with a B – 10 tonne roller until movement of the surface ceases.

An excess fine material shall be removed on completion of compacting and before the next layer of material is placed. The final layer of stone shall in addition be compacted so as to provide a smooth and even surface free from irregularities or loose material and true to cross-section, line and level.

D. Preparation of Surface for Priming

The type of bituminous binder and the rate of application shall be as directed by the Engineer.

Before priming, any surplus fines shall be brushed off to expose a closely knit, compact mosaic of stone and any foreign material shall be removed well clear of the edges.

The finished surface of the base course shall not be primed before 24 hours after final compaction, but shall be priced within 10 days, unless the Engineer's instructions to the contrary.

Made surface of layer shall be checked for line, camber and level and the surface corrected and made good for the approval of the Engineer before the layer is primed.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Preparation of Surface for Priming (Ctd).

The prepared surface of base shall be lightly watered if necessary to ensure the surface is damp where the prime coat is applied, but care must be taken that the base is not saturated and that no pools of water remain on the surface.

B. Spraying of Prime Coat

Immediately after the area to be primed has been prepared and approved by the Engineer the primer shall be applied on to it.

The rate of spray will depend on the texture and density of the surface but will normally be in the range of 0.81/m sq. to 1.10/m sq. The quantity used must give complete coverage of the surface with a slight trace of run off in places. Should the Contractor find that when using the rate of spray directed by the Engineer the covering is inadequate, or there is too much run-off, he shall immediately inform the Engineer and amend the spray rates as directed by the latter.

C. Method of Spraying Prime Coat

The edge of the area shall be marked out with a line of string or wire; pegged down at intervals not exceeding 15 metres on straights or 75 metres on curves.

Bitumen shall be sprayed from a pressure distributor or an approved hand sprayed in small areas. Testing shall not take place on the road and any bitumen split on the ground shall be cleaned off.

When commencing and stopping, sheets of metal at least 2 metres long shall be spread across the full widths to be sprayed to give a clean sharp edge.

The metal sheets or troughs used for testing and the metal sheets used for stopping and starting work shall be cleaned at the end of each day's work.

During spraying all kerbs, road furniture, culverts headwalls, tree bowls and the like which are liable to be disfigured by splashing of bitumen shall be protected, and any such feature which is accidentally marred by bitumen shall be cleaned off with suitable solvent or made good at the Contractor's expense.

When, during spraying, a nozzle becomes blocked or develops a defect, the spraying shall be made good with a hand spray and the machine repaired before further spraying is commenced.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Cutting of Prime Coat

The prime coat shall be allowed to dry out before anything is allowed to pass over the surface. Where the primer puddles, the surplus shall be blinded with sand or quarry dust until the free bitumen is absorbed. Forty-eight hours after priming the Engineer may permit pneumatic tyred vehicles to run over it, provided the surface is lightly sanded or dusted where necessary to prevent adhesion of bitumen to tyres. Such use of the surface is to be discouraged and may only be undertaken on the expense written instructions of the Engineer.

Any re-priming or other reinstatement that becomes necessary as a result of the Contractor allowing traffic to run over the primed surface shall be carried out at the Contractor's expense.

B. Rate of Application of Binder

Immediately prior to commencement spraying of bitumen the existing surface shall be thoroughly brushed to remove loose particles and dust.

The type of binder and the rate of spray shall be as directed by the Engineer. The quantity of binder required will depend upon the shape and size of chippi9ngs the volume and weight of traffic and the nature and absorbency of the existing surface, the rates given upon the drawings or in the Bills of Quantities shall be regarded as provisional.

The rate of spray will generally be between 1.01m sq. and 1.71m sq. The Engineer may, from time to time direct the Contractor to vary the rates of application and the Contractor shall allow in his price for bitumen for such variations in applications.

C. Tolerance

The following shall apply to water bound and hand-packed stone base course; crusher run base course and sub-base as the case may be:

	VARIATION PERMITTED		
Type of Base	mm Thick	mm 3M Straight Edge	mm Variation in Half Width
Stone base course	-0mm +10	+6mm -6mm	+150mm -0mm
Sub-base	+25mm -25mm	+20mm	-50mm

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Transport of Premix (Asphalt Concrete)

The premix shall be dept free of contamination during transportation. Each load shall be covered to protect if from the weather and from dust.

B. Spreading of Premix (Asphalt Concrete)

Immediately after the track coat is applied, the mixture shall be spread by mechanical paver, without segregation and without dragging.

The wearing course mixture shall be placed in widths of two per normal carriageway unless otherwise approved by the Engineer. The second layer to be in wearing course shall be placed in widths to provide a minimum of 0.3m overlap to the longitudinal joint of the first layer of the wearing course and similarly all traverse joints of the wearing course shall have a minimum overlap of 0.3m. The overlap shall be tapered.

Where the Engineer directs that the use of mechanical spreading and finishing equipment is impractical, the mixture may be spread by hand.

A joints with existing compacted bituminous surfacing, whether it be new or old work, the edge of the existing surfacing along the joint shall be neatly cut away in straight lines over a sufficient width to ensure the full specified thickness of new surfacing being placed and the vertical face so informed shall be painted with bitumen immediately in advance of placing the new work.

C. Compaction of Premix (Asphalt Concrete)

Immediately after spreading the mixture shall be compacted to a min. of 96% of the laboratory design Marshal density. Any area of Asphalt surfacing which does not comply with this Specification shall be removed and replaced to the full depths of the concerned, at the Contractor’s own expense.

D. Thickness to be Laid

The maximum un-compacted thickness to be spread in a single operation shall not exceed 70mm and the minimum thickness to be spread in a single operation shall not be less than 35mm. Thickness in excess of 70mm shall be spread in two layers as two separate operations and the upper layer shall have a compacted thickness of 40mm.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Fines

Fines, whether from the heating plant extractor, or other sources, for addition to the mix shall be separately stored and separately proportioned to the mixing unit.

The surface of the road base to be sprayed shall be thoroughly swept to remove any soil and loose and foreign material. Any defects of the surface shall be made good as directed by the Engineer, and no prime coat shall be applied until the surface has been approved by the Engineer.

Immediately after the surface has been prepared and approved by the Engineer the prime coat of M.C. 30 cut back bitumen shall be sprayed at the rate specified.

B. Sand Seal Surface

Immediately after the application of prime coat, stone dust within the following grading envelope, shall be spread over the prime coat in a thin layer and area shall be allowed to cure for at least 24-48 hours and no traffic shall be allowed over the prime during this period.

Sieve Size (mm)	%age by Weight Passing
63	100
51	95-100
4	90-100
2	50-95
1	20-80
0.6	10-50
1.425	3-25
0.3	0-15
0.15	0-8
0.075	0-5

C. Tack Coat

Before the application of tack coat surface to be premixed shall be swept clean of any loose and foreign material and any damaged areas shall be made good.

After the application of tack coat at the specified rates the laying of the premix shall follow immediately.

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Laying of Precast Concrete Kerbs

Precast concrete kerbs to be incorporated in the works shall comply with BS 1340.

All mortar used to joint the kerb shall be mixed to match the colour of the kerbs and the vertical joints between kerbs shall not exceed 13mm in width. Where kerbs are laid to a radius less than 12 metres, they shall be precast to the correct radius. The kerb shall be screened to prevent coating during bitumen spraying and adequately protected from damage the whole period of the work. All damaged kerbs shall be replaced to the satisfaction of the Engineer during the period of the Contract.

Kerbs shall be laid true to line and level on a foundation of Class 20(20) concrete bed, haunched to a height of 75mm from the top and bedded, jointed and pointed in cement mortar. The formwork to the Class 20(20) concrete bed shall be thoroughly compacted and cured.

The rates entered by the Tenderer in Bills of Quantities for the provision and placing of precast concrete kerbs shall include for all necessary concrete bedding and haunching and all necessary shuttering all in accordance with the specification and the drawings.

B. Excavation in Trench for Pipe Culverts, Headwalls and Wingwalls

Trenches for culverts, headwalls, wingwalls shall be excavated to line and depths shown on the drawings or as directed by the Engineer and shall be of sufficient width to give working clearance in the trench but for the purpose of measurement and payment, the width of the trench shall be taken as 1.5D where D is the outside measurement of the pipe. Backfilling of trenches around culverts shall be done to a density of 100% BS Compaction. Excavation for inlet and outfall drains, catch-water drains and trench or sub-soil drains shall be to the dimensions ordered by the Engineer.

C. Laying and Jointing Pipes

Where pipes are to be laid on 'normal' or imported materials, the floor of the trench shall be compacted and shaped so that the barrel rests over a width of at least one third of its diameter and throughout its length of the barrel along the floor.

The under side of the barrel and socket shall then be packed hard with earth or gravel fill material as directed by the Engineer and of maximum particle size not exceeding 25mm diameter and rammed solid.

Where pipes are laid on concrete bed, the pipes shall be bedded on 1:3 cement: sand mortar at least 15mm thick, 150mm wide and extending the full length of the barrel. The underside of the barrel and socket shall be packed hard with Class 15 Concrete.

No pipes shall be laid until the floor of the trenches has been approved by the Engineer. All pipes shall be saturated with water before jointing. All pipes shall be scraped, cleaned inside and the joint flushed up with 1:2 cement: sand mortar (Ogee pipe joints shall be 37mm thick and 150mm wide).

ROADWORKS (Ctd).

WORKMANSHIP (Ctd).

A. Laying and Jointing Pipes (Ctd).

All joints shall be protected from the wind, sun and rain by a covering approved by the Engineer and shall be kept constantly damp for a period of at least 3 days.

B. Concrete Beds Haunches and Surrounds to Pipes

The floor of the trench shall be cleaned, trimmed and compacted before any concrete bed is laid. The concrete bed shall be thoroughly cleaned before any surround, haunch is laid. No concreting shall commence until the previous work has been approved by the Engineer.

All concrete for beds, surrounds and haunches shall be Class 20 concrete and shall be formed to dimensions directed by the Engineer.

Unless otherwise directed by the Engineer, a 150mm concrete surround shall be provided to concrete pipe in the following circumstances: -

.01 Concrete pipes up to and including 0.6m diameter with less than 0.6m cover or more than 3.0m cover.
.02 Concrete pipes over 0.6m diameter and not exceeding 1.0m diameter with less than 1.0m or more than 3.0m cover.
.03 Concrete pipes over 1.0m diameter at any depth.

The unit of measurement for concrete beds, surrounds and haunches shall be the meter and the rate shall include for the provision of transporting and placing of concrete, all strutting and formwork, protection and curing and all labours, tools, plant, supervision, overheads and profit.

C. Grouted Stone Pitching

The stones used for the grouted pitching shall be hard angular rock, roughly cubical in shape and of dimensions such that they can be laid with a minimum thickness equal to that specified.

The interstices of the grouted pitching shall not be filled with fill material, but may be chocked with large rock spalls. The pitching shall be thoroughly soaked with water and a grout of 1:4 cement: sand mortar shall be rammed into the interstices and smoothed off flush with the pitched face.

Grouted pitching to embankments and around structures shall be constructed as soon as possible after embankments have been built. The surface of the filling to receive the pitching shall be compacted and trimmed to slope and the stone hand laid interlocked and rammed.

BILL NO:3 Environmental and Social Management Plan (ESMP)

Item No.	Descriptions	Unit	Quantity	Rate	Amount (Ksh)
1.	**ESMP Mitigation and Management**				
	(a) Provisional Sum of ksh. One Million, Fifteen Thousand for ESMP Mitigation and Management	Provisional Sum			1,015,000.00
	(b) Extra over item (a) for contractor's overheads and profits	%			
2.	**Permits, licenses and approvals**				
	(a) Provisional Sum of ksh. Three Hundred Seventy-Five Thousand for Permits, licenses and approvals	Provisional Sum			375,000.00
	(b) Extra over item (a) for contractor's overheads and profits	%			
3.	**Capacity Development and Training**				
	(a) Provisional Sum of ksh. Six Hundred Thousand for Capacity Development and Training	Provisional Sum			600,000.00
	(b) Extra over item (a) for contractor's overheads and profits	%			
	Total Carried Forward				**1,990,000.00**

Item No.	Descriptions	Unit	Quantity	Rate	Amount (Ksh)
	Total Brought Forward				**1,990,000.00**
4.	**Grievance Mechanism**				
	(a) Provisional Sum of ksh. Four Hundred Fifty Thousand for Grievance Mechanism	Provisional Sum			450,000.00
	(b) Extra over item (a) for contractor's overheads and profits	%			
5.	**Stakeholder Engagement and Community Sensitisation**				
	(a) Provisional Sum of ksh. Three Hundred Thousand for Stakeholders Engagement and Community Sensitisation	Provisional Sum			300,000.00
	(b) Extra over item (a) for contractor's overheads and profits	%			
6.	**CSR and Good Public Gesture Activities including participatory meetings**				
	(c) Provisional Sum of ksh. Five Hundred Sixty Thousand for CSR and Public Gestures Activities Including participatory meetings	Provisional Sum			560,000.00
	(d) Extra over item (a) for contractor's overheads and profits	%			
	Total Carried Forward				**3,300,000.00**

Item No.	Descriptions	Unit	Quantity	Rate	Amount (Ksh)
	Total Brought Forward				**3,300,000.00**
7.	**HIV/AIDS Awareness**				
	(a) Institute an HIV/AIDS awareness campaign to enlighten the community and project staff on HIV stigma and promoting testing, prevention and treatment.				
	(b) Institute an HIV/AIDS prevention campaign among staff and community in the project area				
	(c) Provisional Sum of ksh. Four Hundred Fifty Thousand for Grievance Mechanism	Provisional Sum			450,000.00
	(d) Extra over item (c) for contractor's overheads and profits	%			
8.	**Operation Phase**				
	Cost to be covered under routine facility management.				
	Total For ESMP Carried to Grand summary				**3,750,000.00**

BILLS OF QUANTITIES

ADMINISTRATION BUILDING

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as Class I rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as Class II rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as Class III rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	130		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	606		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	606		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	909		
L	Excavate for column bases commencing from the reduced level not exceeding 1.5m deep	cm	37		
M	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	49		
N	Extra over excavation in different classes of rock	cm	199		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	619		
D	Remove surplus soil and dispose as directed	cm	376		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	190		
F	Ditto to column bases	sm	95		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	38		
H	Column bases	cm	33		
J	Columns	cm	7		
K	Ground beam	cm	21		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
L	Steps	cm	6		
M	150mm thick solid ground floor slab	sm	556		
N	150mm ramp	sm	26		
	Mesh fabric reinforcement				
P	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	556		
Q	Ditto; to ramps	sm	26		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	12600		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	136		
C	Sides of column starters	sm	88		
D	Sides of column bases	sm	90		
E	Soffits of ramp	sm	26		
F	Sides and soffits of ground beam	sm	271		
G	Edges: steps 75mm - 150mm girth	m	47		
H	Edges: ground floor slab 75mm - 150mm girth	m	140		
	Foundation Walling				
J	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	518		
	Imported fill				
K	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	504		
L	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	756		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	504		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	504		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	556		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	67		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	67		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page ADM / 1				
	From Page ADM / 2				
	From Page ADM/ 3				
	From Page ADM / 4				
	From Page ADM / 5				
	From Page ADM / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Ground floor columns	cm	10		
B	Ring beam	cm	25		
C	Roof level columns	cm	4		
D	Roof beam	cm	19		
E	100mm thick vanity tops	sm	6		
F	100mm thick concrete plinths	sm	5		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
G	Assorted bars	Kg	6960		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
H	Sides of ground floor columns	sm	131		
J	Sides and soffits of ring beam	sm	291		
K	Sides of roof level columns	sm	52		
L	Sides and soffits of roof beam	sm	228		
M	Soffits of vanity tops	sm	6		
N	Edges: plinths 75mm - 150mm girth	m	12		
	Mesh fabric reinforcement				
P	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in vanity tops and plinths: including all necessary supports	sm	18		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	383		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
B	200mm wide	m	170		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
C	200mm thick walls	sm	154		
D	150mm thick walls	sm	57		
E	100mm thick walls	sm	41		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
F	200mm thick walls	m	52		
G	150mm thick walls	m	57		
H	100mm thick walls	m	41		
	Gable and Parapet walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
J	200mm thick gable walls	sm	372		
K	200mm thick parapet walls	sm	99		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Coping				
A	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	280		
	Carried to Collection				
	COLLECTION				
	From Page ADM / 9				
	From Page ADM/ 10 (above)				
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING				
	(ALL PROVISIONAL)				
	Roof Covering				
	24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profile, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to Structural Engineer details				
A	Roof covering	sm	794		
	Under-roof sisalation				
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to;	sm	794		
	The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes				
C	200mm x 50mm purlins	m	364		
D	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	128		
E	100mm x 50mm common rafters	m	1177		
F	200mm x 50mm valley rafter	m	87		
G	200mm x 50mm ridge board	m	51		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	TRUSS 1, 1A,1B, 2 2A				
	The following in 36 No. trusses				
A	150mm x 50mm principal rafters	m	382		
B	100mm x 50mm struts and ties	m	504		
C	150mm x 50mm tie beam	m	303		
D	100mm x 50mm kingpost	m	72		
	Rainwater goods				
	610mm girth x 2mm thick mild steel gutter: fixed to fascia with and including steel flat brackets at 1500 mm (maximum) centres: holes for down pipes as necessary: closed ends				
E	Mild steel gutter to details	m	118		
	Extra over rainwater goods for :-				
F	100mm diameter outlet	No	19		
G	Stopped end	No	4		
	Wrot celcured cypress				
H	100mm x 25mm T & G eaves boarding fixed to bearers	sm	89		
J	50mm x 50mm runners	m	148		
K	50mm x 50mm bearers	m	149		
	Wrot celcured prime grade cypress				
L	250mm x 38mm fascia board and verge boards	m	148		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
M	General surfaces of eaves	sm	89		
N	Surfaces between 200mm and 300mm girth	m	148		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page ADM / 11				
	From Page ADM / 12 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	76		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	76		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	76		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	76		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	76		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	700mm width x 2000mm overall size	No	5		
B	900mm width x 2000mm overall size	No	38		
C	900mm width x 1000mm overall size	No	5		
D	900mm width x 3000mm overall size	No	2		
E	2000mm width x 2000mm overall size	No	4		
F	2150mm width x 3000mm overall size	No	4		
G	2700mm width x 2000mm overall size	No	2		
H	4900mm width x 1000mm overall size	No	2		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
J	Windows; pane size to Architect's details	sm	116		
	6mm thick obscured glass and glazing to casements with linseed putty				
K	Windows to washroom areas; pane size to Architect's details	sm	10		
	8mm thick laminated glass and glazing to casements with linseed putty				
L	Windows; pane size to Architect's details	sm	23		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
A	Windows; both sides measured	sm	296		
	Carried to Collection				
	COLLECTION				
	From Page ADM / 14				
	From Page ADM/ 15				
	From Page ADM/ 16				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
A	Supply and fix 50mm thick hollow core flush door; overall size 1000mm x 2400 mm high; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule (D12)	No	1		
B	Ditto 900mm x 2400mm (D8)	No	14		
C	Ditto 800mm x 2400mm (D9)	No	2		
D	Ditto 800mm x 2000mm (D10)	No	4		
	Door Frames				
	Wrot cypress: prime grade; selected				
E	200mm x 50mm thick door frames	m	133		
F	Ditto transomes	m	133		
G	50mm x 75mm Architrave: splayed	m	133		
H	12mm diameter hardwood quodrant	m	133		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
J	Over 100mm but not exceeding 200mm girth	m	133		
K	Not exceeding 100mm girth	m	133		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
L	Over 100mm but not exceeding 200mm girth	m	266		
M	Not exceeding 100mm girth	m	266		
N	General timber surfaces: doors	sm	85		
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
P	Doors; pane size to Architect's details	sm	8		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Metal Doors				
	Supply and fix the following steel door; complete with all necessary ironmongery, steel sections, frame, mullion and stiles (refer to Architect's details)				
A	1500mm x 2550mm pressed steel double leaf door complete with; 75mm x 25mm vertical stile; 75mm x 25mm to and bottom stile; 8mm thick laminated safety glass complete with frames ; hinges, stays, fasteners, assembled and fixed to opening including cutting and pinning lugs; to Architect's , detail and specification (D17)	No	2		
	Aluminium Framed Door				
	Supply and fix aluminium framed doors with approved powder coated aluminium in framing in sections of size 75mm x 35mm x 2mm thick fixed to wall / beam / column around openings, including glazing with 8mm thick laminated glass; secured to the framing using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds with all the necesarry ironmongery and fittings; all to Architect's door schedules' details and approval				
B	Single leaf doors; overall size 800mm x 2100mm overall height (D6)	No	1		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
C	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	31 1/2		
D	Stainless steel (304) thumb turn indicator locks	No	5		
E	Three lever mortice locks with furniture	No	16		
F	Polished stainless steel door handles	No	42		
G	Rubber door stopper	No	21		
H	2mm thick satin stainless steel kick plate screwed to door surfaces	No	42		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	2mm thick satin stainless steel push plate screwed to door surfaces	No	21		
B	Aluminium coat hanger	No	7		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
C	Doors; both sides measured	sm	16		
	Carried to Collection				
	COLLECTION				
	From Page ADM / 17				
	From Page ADM/ 18				
	From Page ADM/ 19 (above)				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	479		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
B	400mm x 400mm x 8mm thick tiles	sm	479		
C	150mm high skirting	m	326		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	887		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive ceramic tiles (m.s.)	sm	98		
F	Vanity tops	sm	6		
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
G	400mm x 400mm x 8mm thick tiles	sm	98		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
A	Walls	sm	887		
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
B	Walls and concrete surfaces	sm	581		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
C	Externally to walls and concrete surfaces	sm	581		
	CEILING & BEAM FINISHES				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Sides and soffits of beams	sm	291		
	Wrot celcured cypress				
E	25mm Tongue and Groove (T&G) boarding fixed to and including brandering	sm	112		
F	75mm coved cornice	m	53		
	Accoustic Celing				
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
G	Ceiling: patterns to Architect's approval and detail	sm	348		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
A	Beams	sm	291		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
B	Softboard ceiling internally	sm	112		
C	Surfaces 0 - 100mm girth; cornice	m	53		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	STEPS AND RAMP AND FINISHES				
	Screed: cement and sand (1:3): on concrete wood floated				
A	20mm thick: to ramps	sm	26		
B	20mm thick: to 800mm wide treads to receive ceramic tiles	m	72		
C	20mm thick: 150mm high risers ditto	m	79		
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.(Prime cost rate for puchase of tiles Ksh. 1500 per square metre) Rates to include for aluminium corner strip				
D	800mm wide treads	sm	58		
E	150mm high risers	m	79		
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
F	20mm thick: to ramps	sm	26		
G	20mm thick; to vanity tops	sm	6		
	Ramp/ Steps railing				
H	900mm high balustrading in mild steel steel comprising 25mm x 50mm diameter mild steel rectangular hollow section (RHS) handrail, 50mm x 50mm SHS balusters (standards) at 1000mm centres with one end grouted to concrete floor and other end welded to handrail; 25mm x 6mm flat profile at 100mm centers; powder coated to approval; all as per architect's detail	m	68		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page ADM / 20				
	From Page ADM/ 21				
	From Page ADM/ 22				
	From Page ADM/ 23				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 8; JOINERY & FIXTURES				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	100mm thick concrete plinth	sm	3		
B	50mm thick counter top and shelves	sm	3		
	Mesh fabric reinforcement				
C	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	6		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Soffits of counter tops and shelves	sm	3		
E	Edges: Plinths 75mm - 150mm girth	m	6		
F	Edges: of counter tops depth not exceeding 75mm	m	6		
	Screed: cement and sand (1:3) on concrete: wood floated finished				
G	20mm thick screed	sm	6		
	Supply and fix 20mm thick Medium Density Fibreboard (MDF), complete with runners and bearers including edge lipping, brackets or supports and all necessary fixings to;-				
H	Side boards	sm	4		
J	Divisions	sm	3		
K	Shelving	sm	6		
L	Bottoms	sm	6		
M	Top	sm	3		
N	150mm high Skirting	m	6		
	Door				
P	Supply and fix approved doors complete with frames, hinges and handles overall size 450mm x 780mm	No	14		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved granite with adhesive; to regular pattern: bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting laid on cement sand base (m/s)				
A	20mm thick granite top	sm	3		
	Prepare surfaces: apply three coats of approved varnish: on timber surfaces: to				
B	General timber surfaces	sm	54		
	Drawers				
C	Supply and fix drawer size 800mm x 600mm x 379mm high, constructed of 20mm thick MDF bottom, top, sides and divisions all properly glued, housed and blocked together including all necessary grooves fixing to position and apply three coats of approved varnish as per Architects approval	No	1		
D	Ditto; 800 x 600 x 250mm high	No	1		
E	Diito; 800 x 600 x 100mm high	No	1		
	Carried to Collection				
	COLLECTION From Page ADM / 25 From Page ADM/ 26 (above)				
	JOINERY & FIXTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	ADMINISTRATION BUILDING				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		ADM / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		ADM / 8		
	3. WALLING		ADM / 10		
	4. ROOF		ADM / 13		
	5. WINDOWS		ADM / 16		
	6. DOORS		ADM / 19		
	7. FINISHES		ADM / 24		
	8. JOINERY FITTINGS AND FIXTURES		ADM / 26		
	TOTAL ADMINISTRATION BUILDING CARRIED TO MAIN SUMMARY				

TEACHING BUILDING

GROUND FLOOR

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	146		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	2		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	4		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	3		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	496		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	496		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	717		
L	Excavate for column bases commencing from the reduced level not exceeding 1.5m deep	cm	75		
M	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	36		
N	Extra over excavation in different classes of rock	cm	166		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	252		
D	Remove surplus soil and dispose as directed	cm	576		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	201		
F	Ditto to column bases	sm	105		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	21		
H	Column bases	cm	33		
J	Columns	cm	7		
K	200mm thick Shear Walls	sm	21		
L	Ground beam	cm	17		
M	250mm thick lift walls	sm	6		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
N	150mm thick solid ground floor slab	sm	480		
	Mesh fabric reinforcement				
P	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	480		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	12060		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	68		
C	Sides of column starters	sm	88		
D	Sides of column bases	sm	90		
E	Sides of shear walls	sm	42		
F	Sides and soffits of ground beam	sm	161		
G	Sides of lift walls	sm	12		
H	Edges: ground floor slab 75mm - 150mm girth	m	95		
	Foundation Walling				
J	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	165		
	Imported Fill				
K	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	480		
L	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	576		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	480		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	480		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	480		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	42		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	42		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page TB GF / 1				
	From Page TB GF / 2				
	From Page TB GF/ 3				
	From Page TB GF / 4				
	From Page TB GF / 5				
	From Page TB GF / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Columns	cm	16		
B	Beams	cm	20		
C	200mm thick shear walls	sm	31		
D	250mm thick lift walls	sm	19		
E	150mm thick slab to raised auditorium	sm	50		
F	150mm thick sloping slab of auditorium	sm	60		
G	Steps of auditorium	cm	9		
H	Staircase	cm	9		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
J	Assorted bars	Kg	9774		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
K	Sides of columns	sm	236		
L	Sides and soffits of beams	sm	308		
M	Sides of shear walls	sm	62		
N	Sides of lift walls	sm	38		
P	Soffits of 150mm thick raised auditorium slab	sm	50		
Q	Soffits of sloping slabs of auditorium	sm	60		
R	Sides of steps	sm	20		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Edges: raised auditorium floor slab 75mm - 150mm girth	m	44		
B	Soffits of sloping slabs of staircase	sm	18		
C	Ditto to 150mm risers and edges	m	93		
D	Ditto edges of strings	m	24		
E	Ditto landing edges	m	21		
	Carried to Collection				
	COLLECTION From Page TB GF / 8 From Page TB GF / 9 (Above)				
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	206		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
B	200mm wide	m	88		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
C	200mm thick walls	sm	216		
D	150mm thick walls	sm	30		
E	100mm thick walls	sm	38		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
F	200mm thick walls	m	75		
G	150mm thick walls	m	11		
H	100mm thick walls	m	16		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	29		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	29		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	29		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	29		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	29		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	W03; 900mm width x 1000mm overall size	No	5		
B	W16; 1200mm width x 5400mm overall size	No	4		
C	W18; 600mm width x 3600mm overall size	No	4		
D	W19; 3000mm width x 2000mm overall size	No	3		
E	W20; 900mm width x 2000mm overall size	No	6		
F	W21; 3000mm width x 1000mm overall size	No	1		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
G	Windows; pane size to Architect's details	sm	25		
	6mm thick obscured glass and glazing to casements with linseed putty				
H	Windows to washroom areas; pane size to Architect's details	sm	9		
	8mm thick laminated glass and glazing to casements with linseed putty				
J	Windows; pane size to Architect's details	sm	28		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
K	Windows; both sides measured	sm	142		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page TB GF / 11				
	From Page TB GF / 12				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; DOORS				
	Timber doors				
	Supply and fix 50mm thick hollow core flush door; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule				
A	D08; 900mm x 2400mm high overall height; including a fanlight of 600mm high (m.s); single leaf door	No	9		
B	D10; 800mm x 2000mm high overall height; single leaf door	No	4		
C	D12; 1000mm x 2400mm high overall height; including a fanlight of 600mm high (m.s); single leaf door	No	2		
D	D18; 1500mm x 2400mm high overall height; double leaf door	No	2		
	Door Frames				
	Wrot cypress: prime grade; selected				
E	200mm x 50mm thick door frames	m	102		
F	Ditto transomes	m	102		
G	50mm x 75mm Architrave: splayed	m	102		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
H	Over 100mm but not exceeding 200mm girth	m	102		
J	Not exceeding 100mm girth	m	102		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
K	Over 100mm but not exceeding 200mm girth	m	204		
L	Not exceeding 100mm girth	m	204		
M	General timber surfaces: doors	sm	88		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
A	Doors; pane size to Architect's details	sm	6		
	Metal Doors				
	Supply and fix the following steel doors; comprising of 75mm x 25mm horizontal and vertical stiles; 75mm x 25mm top and bottom stiles; 8mm thick laminated safety glass complete with frames ; complete with all necessary ironmongery, steel sections, frame, mullion and stiles (refer to Architect's details)				
B	D24; 800mm x 1800mm high overal height; single leaf door	No	1		
C	D26; 1800mm x 2700mm high overal height; double leaf door	No	2		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
D	Doors; both sides measured	sm	23		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; finish to Architect's door schedule and approval				
E	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	29		
F	Stainless steel (304) thumb turn indicator locks	No	4		
G	Three lever mortice locks with furniture	No	11		
H	Polished stainless steel door handles	No	30		
J	Rubber door stopper	No	17		
K	2mm thick satin stainless steel kick plate screwed to door surfaces	No	17		
L	2mm thick satin stainless steel push plate screwed to door surfaces	No	17		
M	Aluminium coat hanger	No	4		
N	25mm diameter stainless steel handles	No	4		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page TB GF / 14				
	From Page TB GF / 15				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	449		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
B	400mm x 400mm x 8mm thick tiles	sm	296		
C	150mm high skirting	m	326		
	PVC Rubber Tiles				
	Supply and fix approved interlocking PVC rubber floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
D	Rubber Flooring	sm	153		
E	150mm high skirting	m	80		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
F	Walls	sm	736		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
G	Walls to receive ceramic tiles (m.s.)	sm	28		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
A	400mm x 400mm x 8mm thick tiles	sm	28		
B	Ditto lift tiles	sm	26		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
C	Walls	sm	736		
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
D	Walls and concrete surfaces	sm	98		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
E	Externally to walls and concrete surfaces	sm	98		
	Keying and Pointing				
F	Form keyed and pointed finish to exposed masonry walling, including striking and finishing joints in cement and sand mortar and brushing the wall face to produce a uniform textured keyed appearance	sm	179		
	CEILING & BEAM FINISHES				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
G	Ceiling and sides and soffits of beams	sm	296		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
H	Ceiling and sides and soffits of beams	sm	296		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	STAIRCASE FINISHES				
	Staircase Floor Finish				
	Screed: cement and sand (1:4) on concrete: wood floated finished				
A	Landing	sm	9		
B	150mm high skirting to profile of staircase	m	93		
C	300mm wide treads	m	57		
D	150mm high staircase risers	m	36		
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
E	Landing	sm	9		
F	150mm high skirting to profile of staircase	m	93		
G	300mm wide treads	m	57		
H	150mm high staircase risers	m	36		
	Mild Steel Stage				
J	Allow a provisional sum for construction of a mild steel stage platform approximately 12m² ; finished with approved varnished timber decking boards on mild steel framework; complete with mild steel columns, beams, bracing members, supports, base plates, cleats, connections, welding, bolting, anchoring to floor slab and all necessary structural supports and accessories; The stage to include staircases on both sides each comprising three mild steel framed steps complete with treads and risers powder coated finish, fixing accessories and all necessary works; all in accordance with engineer's details and instructions	Item			
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page TB GF / 17				
	From Page TB GF / 18				
	From Page TB GF / 19 (above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; JOINERY & FIXTURES				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	38mm thick concrete shelves	sm	24		
	Mesh fabric reinforcement				
B	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	24		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
C	Soffits of shelves	sm	24		
D	Edges: of shelves depth not exceeding 75mm	m	44		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive terrazzo (m.s.)	sm	48		
	Terrazzo				
F	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)	sm	48		
	JOINERY & FIXTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	TEACHING BUILDING GROUND BUILDING				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		TB GF / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		TB GF / 9		
	3. WALLING		TB GF / 10		
	4. WINDOWS		TB GF / 13		
	5. DOORS		TB GF / 16		
	6. FINISHES		TB GF / 20		
	7. JOINERY & FIXTURES		TB GF / 21		
	TEACHING BUILDING GROUND FLOOR CARRIED TO MAIN SUMMARY				

FIRST FLOOR

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 1: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Columns	cm	18		
B	Columns to roof level	cm	9		
C	Beams	cm	18		
D	Beams on roof level	cm	10		
E	200mm thick shear walls	sm	22		
F	250mm thick lift walls	sm	32		
G	150mm thick first floor slab	sm	280		
H	150mm thick lift top slab	sm	4		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
J	Assorted bars	Kg	13200		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
K	Sides of columns	sm	408		
L	Sides and soffits of beams	sm	496		
M	Sides of shear walls	sm	44		
N	Sides of lift walls	sm	64		
P	Soffits of first floor and lift top slab	sm	284		
Q	Edges: ground floor slab 75mm - 150mm girth	m	156		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	260		
B	150mm thick walls	sm	124		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
C	200mm thick walls	sm	429		
D	150mm thick walls	sm	50		
E	100mm thick walls	sm	49		
	Concrete Vents				
F	300mm x 300mm precast concrete vents blocks laid and jointed with cement and sand mortar; painted to detail; all to Architect's details and specifications	sm	12		
	Coping				
G	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	8		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 3: ROOFING				
	(ALL PROVISIONAL)				
	Roof Covering				
	24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details				
A	Roof covering	sm	605		
	Under-roof sisalation				
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to;	sm	605		
	The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes				
C	150mm x 50mm purlins	m	698		
D	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	150		
E	150mm x 50mm common rafters	m	374		
F	150mm x 50mm valley and hip rafter	m	75		
G	200mm x 50mm ridge board	m	70		
H	50mm x 25mm batterns	m	80		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	TRUSS T1				
	The following in 3 No. truss				
A	150mm x 50mm principal rafters	m	394		
B	100mm x 50mm struts and ties	m	1543		
C	150mm x 50mm tie beam	m	230		
D	100mm x 50mm kingpost	m	84		
	TRUSS T2				
	The following in 2 No. truss				
E	150mm x 50mm principal rafters	m	366		
F	100mm x 50mm struts and ties	m	986		
G	150mm x 50mm tie beam	m	194		
H	100mm x 50mm kingpost	m	68		
	UPVC rainwater goods to M/s Metro Catalogue				
J	125mm x 150mm box gutter fixed with manufacturer's approved brackets at 600mm centres	m	100		
	Wrot celcured cypress				
K	100mm x 25mm T & G eaves boarding fixed to bearers	sm	90		
L	50mm x 50mm runners	m	170		
M	50mm x 50mm bearers	m	240		
	Wrot celcured prime grade cypress				
N	250mm x 38mm fascia board and verge boards	m	240		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
P	General surfaces of eaves	sm	90		
Q	Surfaces between 200mm and 300mm girth	m	240		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Perspex Roofing				
	Supply and fix 12mm thick clear perspex roofing shade to approved framework (measured separately).				
A	Roof Covering	sm	215		
	Unframed mild steel work as described complete with bolts, nuts, washers, splash plates and base plates; including drilling, hoisting and placing at roof level, one coat red oxide primer before fixing and touch up on completion to approval				
	The following in 8No. Truss type T1 including all necessary nailing/bolting, drilling holes				
B	100mm x 50mm x 4mm Rectangular Hollow Section (RHS) external members x (8.5kg/m)	Kgs	2632		
C	75mm x 75mm x 3mm Square Hollow Section (SHS) internal members x (6.6kg/m)	Kgs	1420		
	Carried to Collection				
	COLLECTION				
	From Page TB FF / 3				
	From Page TB FF / 4				
	From Page TB FF / 5 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	34		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	34		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	34		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	34		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	34		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	W19; 3000mm width x 2000mm overall size	No	3		
B	W20; 900mm width x 2000mm overall size	No	14		
C	W22; 900mm width x 1500mm overall size	No	6		
D	W23; 600mm width x 3600mm overall size	No	6		
E	W24; 3000mm width x 1500mm overall size	No	1		
F	Window above steel doors on ground floor; 1800mm width x 2550mm overall size	No	2		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
G	Windows; pane size to Architect's details	sm	65		
	8mm thick laminated glass and glazing to casements with linseed putty				
H	Windows; pane size to Architect's details	sm	10		
J	Ditto for 12mm thick glass	sm	5		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
K	Windows; both sides measured	sm	160		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page TB FF / 6				
	From Page TB FF / 7 (above)				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; DOORS				
	Timber doors				
	Supply and fix 50mm thick hollow core flush door; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule				
A	D08; 900mm x 2400mm high overall height; including a fanlight of 600mm high (m.s); single leaf door	No	8		
B	D07; 900mm x 2400mm high overall height; single leaf door; including 8mm thick laminated glass vision panel with beading to architects approval	No	2		
C	D10; 800mm x 2000mm high overall height; single leaf door	No	4		
D	D12; 1000mm x 2400mm high overall height; including a fanlight of 600mm high (m.s); single leaf door	No	2		
	Door Frames				
	Wrot cypress: prime grade; selected				
E	200mm x 50mm thick door frames	m	60		
F	Ditto transomes	m	60		
G	50mm x 75mm Architrave: splayed	m	60		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
H	Over 100mm but not exceeding 200mm girth	m	60		
J	Not exceeding 100mm girth	m	60		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
K	Over 100mm but not exceeding 200mm girth	m	120		
L	Not exceeding 100mm girth	m	120		
M	General timber surfaces: doors	sm	77		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
A	Doors; pane size to Architect's details	sm	5		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; finish to Architect's door schedule and approval				
B	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	24		
C	Stainless steel (304) thumb turn indicator locks	No	4		
D	Three lever mortice locks with furniture	No	16		
E	Polished stainless steel door handles	No	32		
F	Rubber door stopper	No	16		
G	2mm thick satin stainless steel kick plate screwed to door surfaces	No	16		
H	2mm thick satin stainless steel push plate screwed to door surfaces	No	16		
J	Aluminium coat hanger	No	4		
K	25mm diameter stainless steel handles	No	4		
	Carried to Collection				
	COLLECTION				
	From Page TB FF / 9				
	From Page TB FF / 10 (Above)				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	280		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
B	400mm x 400mm x 8mm thick tiles	sm	280		
C	150mm high skirting	m	183		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	577		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive ceramic tiles (m.s.)	sm	28		
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
F	400mm x 400mm x 8mm thick tiles	sm	28		
G	Ditto lift tiles	sm	44		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
H	Walls	sm	577		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
A	Walls and concrete surfaces	sm	274		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
B	Externally to walls and concrete surfaces	sm	274		
	Keying and Pointing				
C	Form keyed and pointed finish to exposed masonry walling, including striking and finishing joints in cement and sand mortar and brushing the wall face to produce a uniform textured keyed appearance	sm	87		
	Wrot celcured cypress				
D	100mm x 25mm T & G eaves boarding fixed to and including brandering	sm	280		
E	75mm coved cornice	m	53		
	Accoustic Celing				
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
F	Ceiling: patterns to Architect's approval and detail	sm	177		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
G	Softboard ceiling internally	sm	280		
H	Surfaces 0 - 100mm girth; cornice	m	53		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Glass Canopy Roofing				
	Supply and fix 8mm thick tempered glass roofing canopy; cable suspended and fixed to approved framework including all necessary curvatures, hoisting, placing and connections to structural Engineer details and specifications				
A	Glass Canopy	sm	20		
	Unframed mild steel work as described complete with bolts, nuts, washers, splash plates and base plates; including drilling, hoisting and placing approximately 4200mm above ground floor slab level, one coat red oxide primer before fixing and touch up on completion to approval				
B	SHS members 100mm x 100 mm x 4mm (12.18kg/m)	Kg	488		
	Carried to Collection				
	COLLECTION				
	From Page TB FF / 11				
	From Page TB FF / 12				
	From Page TB FF / 13				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; JOINERY & FIXTURES				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	38mm thick concrete shelves	sm	40		
	Mesh fabric reinforcement				
B	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	40		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
C	Soffits of shelves	sm	40		
D	Edges: of shelves depth not exceeding 75mm	m	44		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive terrazzo (m.s.)	sm	80		
	Terrazzo				
F	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)	sm	80		
	JOINERY & FIXTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	TEACHING BUILDING GROUND BUILDING				
	FIRST FLOOR SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. REINFORCED CONCRETE SUPERSTRUCTURE		TB FF / 1		
	2. WALLING		TB FF / 2		
	3. ROOFING		TB FF / 5		
	4. WINDOWS		TB FF / 8		
	5. DOORS		TB FF / 10		
	6. FINISHES		TB FF / 13		
	7. JOINERY & FIXTURES		TB FF / 14		
	TEACHING BUILDING FIRST FLOOR CARRIED TO MAIN SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	TEACHING BUILDING SUMMARY				
	ELEMENT NO.		**PAGE NO.**		
	1. GROUND FLOOR		GF/ 22		
	2. FIRST FLOOR		FF / 16		
	TOTAL TEACHING BUILDING WORKS CARRIED TO MAIN WORKS SUMMARY				

AQUA CENTRE

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	155		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	3		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	4		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	1470		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	1470		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	2205		
L	Excavate for column bases commencing from the reduced level depth exceeding 1.5m but not exceeding 3.0m deep	cm	40		
M	Excavate for strip foundation commencing from the reduced level depth exceeding 1.5m but not exceeding 3.0m deep	cm	99		
N	Extra over excavation in different classes of rock	cm	441		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item	1		
B	Allow for keep excavations free of water including any necessary pumping	Item	1		
C	Return, fill and ram selected soil in foundations	cm	555		
D	Remove surplus soil and dispose as directed	cm	2343		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	330		
F	Ditto to column bases	sm	113		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	83		
H	Column bases	cm	34		
J	Foundation Columns	cm	11		
K	Ground beam	cm	61		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
L	150mm thick solid ground floor slab	sm	744		
M	250mm thick solid ground floor slab	sm	636		
	Mesh fabric reinforcement				
N	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	1379		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted Bars	Kg	41760		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	165		
C	Sides of column starters	sm	160		
D	Sides of column bases	sm	109		
E	Sides and soffits of ground beam	sm	485		
F	Edges: ground floor slab 75mm - 150mm girth	m	278		
G	Edges: ground floor slab 225mm - 300mm girth	m	269		
	Foundation Walling				
H	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	1025		
	Imported Fill				
J	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	1379		
K	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	1789		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	1379		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	1379		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	1379		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	84		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	84		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page AQC / 1				
	From Page AQC / 2				
	From Page AQC/ 3				
	From Page AQC / 4				
	From Page AQC / 5				
	From Page AQC / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Ground floor columns	cm	15		
B	Ring beam	cm	92		
C	Roof level columns	cm	2		
D	Roof beam	cm	27		
E	Gutter beam	cm	24		
F	100 mm thick Gutter Slab	sm	327		
G	Steps	cm	4		
H	150 mm thick Ramp	sm	26		
J	100mm thick vanity tops	sm	7		
	Vibrated reinforced insitu concrete class 30/30; with minimum cube crushing strength of 30N/mm² at 28 days; the concrete to incorporate an approved Sika waterproofing admixture as Sika® Plastocrete® N KE or other equal and approved in				
K	200 mm thick tank walls	sm	553		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
L	Assorted Bars	Kg	36946		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
M	Sides of ground floor columns	sm	214		
N	Sides and soffits of ring beam	sm	1022		
P	Sides of roof level columns	sm	28		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Formwork cont'd				
A	Sides and soffits of roof beam	sm	311		
B	Soffits of gutter slab	sm	338		
C	Sides and soffits of gutter beam	sm	309		
D	Sides of tank	sm	1105		
E	Sides of Steps 225mm - 300mm girth	m	4		
F	Face of riser 75 - 150mm high.	m	63		
G	Sides of ramp 75 - 150mm high.	m	10		
	Waterproofing				
	Acrylic Cementitious waterproofing Coating or other equal and approved; prepare surfaces; two coat application; nominal thickness 2 mm; applied strictly in accordance with manufacturer's printed instructions; by an approved specialist sub-contractor; including providing a 10 year guarantee; generally to :				
H	200 mm tank walls	sm	1105		
J	250 mm tank slab	sm	636		
K	100 mm gutter slab including skirting	sm	443		
	PVC water bar with centre bubble; joints; horizontally or vertically lapped and sealed generally to:				
L	200mm thick tank wall	sm	369		
	Carried to Collection				
	COLLECTION				
	From Page AQC / 8				
	From Page AQC / 9 (above)				
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	487		
B	150mm thick walls	sm	291		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm thick walls	m	206		
D	150mm thick walls	m	97		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
E	200mm thick walls	sm	366		
F	150mm thick walls	sm	55		
G	100mm thick walls	sm	61		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
H	200mm thick walls	m	127		
J	150mm thick walls	m	23		
K	100mm thick walls	m	25		
	Gable and Parapet walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
L	200mm thick gable walls	sm	63		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Coping				
A	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	290		
	Mild steel glazed partitions				
	Full Height a mild steel glazed partitioning comprising 50 mm x 50 mm x 2 mm thick "heavy duty" mild steel framework to; infilled with 8 mm thick laminated clear glazing with approved film; complete with all the necessary accessories, beadings, glazing strips e.t.c: all to Architects details and approval; generally to:-				
B	Aqua Center Entrance Lobby	sm	22		
	Carried to Collection				
	COLLECTION				
	From Page AQC / 10				
	From Page AQC/ 11 (above)				
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING				
	(ALL PROVISIONAL)				
	Roof Structure				
	Structural Timber: Cypress: vacuum pressure impregnated with Tanalith E or any other equal and approved				
	Framed members				
A	External members: 150 x 50mm rafters in trusses	m	451		
B	External members: 150 x 50mm tie beam in trusses	m	345		
C	Internal members: 100 x 50mm Struts and ties in trusses	m	554		
	Unframed members				
D	100 x 50mm Independent rafters	m	1420		
E	150 x 50mm Hip rafters	m	51		
F	150 x 50mm Valley rafters	m	12		
G	150 x 50mm Ridge boards	m	95		
H	100 X 50 mm wall plate; including bolts at 1.0m centres	m	212		
J	200 X 50 mm purlins	m	550		
	Structural Steelwork to BS 449				
	Structural mild steel sections in red oxide primer, including fabrication, hoisting and erecting; to include all necessary connections with steel connectors bolts & nuts, welding and the like: finished in three coats eggshell paint to all metal surfaces: in accordance with Structural Engineer's details and drawings: as described to				
	Framed members: weldable				
K	External members: 100 x 50 x 4 mm thick RHS in mild steel	m	2829		
L	Internal members: 75 x 50 x 3 mm thick RHS in mild steel	m	1021		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Unframed members: weldable				
A	Purlins ZP50: 127.0 x 50.8 x 19 x 2 mm thick in mild steel	m	1554		
B	Anti-Sag rods: 12 mm diameter round bars	m	85		
	Eaves Finishes				
	Wrot celcured cypress				
C	50mm x 50mm runners	m	347		
D	50mm x 50mm bearers	m	289		
	Wrot celcured prime grade cypress				
E	250mm x 38mm fascia board and verge boards	m	123		
F	100mm x 25mm T & G eaves boarding fixed to bearers	sm	170		
	Painting and decorations				
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
G	General surfaces of eaves	sm	170		
H	Surfaces between 200mm and 300mm girth	m	123		
	Roof Covering				
	24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details				
J	Roof covering	sm	1483		
K	Ridge cap to match	m	95		
L	Hip cap to match	m	51		
M	Valley cap to match	m	12		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	**Under-roof sisalation** Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to;	sm	1483		
	Carried to Collection				
	COLLECTION From Page AQC / 12 From Page AQC / 13 From Page AQC / 14 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	98		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	98		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	98		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	98		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	98		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	Window comprising 4 No. openable top hung light, overall size 4900 x 1000 mm High **[W02]**	No	2		
B	Window comprising 1 No. openable top hung light, overall size 1200 x 1200 mm High **[W10]**	No	6		
C	Window comprising 8 No. openable top hung light, overall size 3600 x 2000 mm High **[W11]**	No	9		
D	Window comprising 2 No. openable top hung light, overall size 1200 x 2000 mm High **[W12]**	No	12		
E	Window comprising 2 No. openable top hung light, overall size 600 x 1800 mm High **[W13]**	No	29		
F	Window comprising 1 No. openable top hung light, overall size 950 x 1050 mm High **[W14]**	No	2		
G	Window comprising 1 No. openable top hung light, overall size 1200 x 1050 mm High **[W15]**	No	7		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
H	Windows; pane size to Architect's details	sm	136		
	6mm thick obscured glass and glazing to casements with linseed putty				
J	Windows to washroom areas; pane size to Architect's details	sm	18		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
A	Windows; both sides measured	sm	285		
	Carried to Collection				
	COLLECTION				
	From Page AQC / 15				
	From Page AQC/ 16				
	From Page AQC/ 17				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
	Supply and fix 50mm thick hollow core flush door; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule				
A	Supply and fix door overall size 800 x 2000mm high ; all to Architect's detail drawings and approval **[D10]**	No	8		
B	Supply and fix door overall size 900 x 2100mm high ; including 900 x 350 mm fun-light in 6 mm thick clear glass (m.s) fixed to framing with matching beadings (m.s) ; all to Architect's detail drawings and approval **[D21]**	No	17		
C	Supply and fix door overall size 1000 x 2100mm high ; including 900 x 350 mm fun-light in 6 mm thick clear glass (m.s) fixed to framing with matching beadings (m.s) ; all to Architect's detail drawings and approval **[D23]**	No	2		
	Frames and Linings				
	Wrot cypress: prime grade; selected				
D	200mm x 50mm door frames	m	153		
E	Ditto transomes	m	153		
F	50mm x 75mm Architrave: splayed	m	153		
G	25 mm dia. quadrant beading	m	153		
H	20 x 15 mm glazing beading	m	66		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
J	Over 100mm but not exceeding 200mm girth	m	306		
K	Not exceeding 100mm girth	m	306		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
A	Over 100mm but not exceeding 200mm girth	m	306		
B	Not exceeding 100mm girth	m	306		
C	General timber surfaces: doors	sm	98		
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
D	Doors; pane size to Architect's details	sm	4		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
E	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	40 1/2		
F	Stainless steel (304) thumb turn indicator locks	No	8		
G	Three lever mortice locks with furniture	No	19		
H	Polished stainless steel door handles	No	54		
J	Rubber door stopper	No	27		
K	2mm thick satin stainless steel kick plate screwed to door surfaces	No	54		
L	2mm thick satin stainless steel push plate screwed to door surfaces	No	54		
M	Aluminium coat hanger	No	27		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Metal Doors				
	Supply and fix the following steel door; complete with all necessary ironmongery, steel sections, frame, mullion and stiles (refer to Architect's details)				
A	Supply and fix pressed steel steel door overall size 1500 x 2550 mm high in two equal leaves fixed to powder coated mild steel door frame ; including 8 mm thick laminated safety glass to each leaf fixed to mild steel framing with matching beadings; complete with purpose made ironmongery; all to Architect's detail drawings and approval **[D17]**	No	4		
	Carried to Collection				
	COLLECTION				
	From Page AQC / 18				
	From Page AQC/ 19				
	From Page AQC/ 20				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	EXTERNAL FINISHES				
	External wall finishes				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
A	Concrete surfaces externally; finished smooth	sm	359		
B	Masonry surfaces externally; finished smooth	sm	353		
	Key pointing to horizontal joints and flushing to vertical joints; in cement and sand (1:3) mortar: as described to				
C	Masonry surfaces externally; finished smooth	sm	487		
	Floor Finishes				
	Cement and sand (1:3) mortar: to screeds, backings, beds etc: in				
D	32mm Thick bed screed to receive ceramic floor tiles (m/s)	sm	79		
	Steps and Ramp finishes				
	25mm thick screeds: Cement and sand (1:3) mortar: wood-floated to receive terrazzo floor (m.s); including plastic dividing strips cast in screeds: as described to				
E	Surfaces of ramps, sloping	sm	26		
	32mm thick screeds: Cement and sand (1:3) mortar: wood-floated to Ceramic floor tiles (m.s); as described to				
F	Treads to steps, 400mm wide	sm	25		
G	Risers to steps, 150mm high	sm	9		
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
H	Surfaces of ramps, sloping: including formation of herringbone pattern to form anti-slip grooves	sm	26		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Ceramic floor tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
A	400mm x 400mm x 8mm thick tiles	sm	113		
B	Skirting, 150 mm high	m	49		
	INTERNAL FINISHES				
	Wall Finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
C	Concrete surfaces, internally	sm	1848		
D	Masonry surfaces, internally	sm	1609		
E	Jambs and reveals: 100 - 200 mm girth	sm	611		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
F	Walls to receive ceramic tiles (m.s.)	sm	57		
	Ceramic wall tiles				
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
G	400mm x 400mm x 8mm thick tiles	sm	57		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Painting and decoration				
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
A	Plastered concrete surfaces, internally	sm	1848		
B	Plastered walls surfaces, internally	sm	1609		
C	Jambs and reveals: 100 - 200 mm girth	sm	611		
	Floor Finishes				
	Cement and sand (1:3) mortar: to screeds, backings, beds etc: in				
D	32mm Thick bed screed to receive ceramic floor tiles (m/s)	sm	278		
E	32mm Thick bed screed to receive floor tiles (m/s)	sm	67		
F	32mm thick screeds to grow out tanks area	sm	207		
	Ceramic floor tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
G	400mm x 400mm x 8mm thick tiles	sm	345		
H	Skirting, 150 mm high	sm	232		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Ceiling Finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
A	Soffits of gutter slab	sm	327		
	Painting and decoration				
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
B	Soffits of gutter slab	sm	327		
	Accoustic Celing				
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
C	Ceiling: patterns to Architect's approval and detail	sm	247		
	Carried to Collection				
	COLLECTION				
	From Page AQC / 21				
	From Page AQC/ 22				
	From Page AQC/ 23				
	From Page AQC/ 24(Above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 8; JOINERY & FIXTURES				
	PROCESSING ROOM				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	100mm thick concrete plinth	sm	14		
B	50mm thick counter top and shelves	sm	14		
	Mesh fabric reinforcement				
C	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	28		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Soffits of counter tops and shelves	sm	14		
E	Edges: Plinths 75mm - 150mm girth	m	41		
F	Edges: of counter tops depth not exceeding 75mm	m	41		
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
G	100mm thick walls	sm	9		
	Screed: cement and sand (1:3) on concrete: wood floated finished				
H	20mm thick screed	sm	28		
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
J	Walls	sm	18		
	Terrazzo				
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
K	20mm thick to counter tops	sm	14		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement				
A	400mm x 400mm x 8mm thick tiles	sm	14		
B	150mm high skirting	m	19		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
C	Walls	sm	18		
	Carried to Collection				
	COLLECTION				
	From Page AQC / 25				
	From Page AQC/ 26 (Above)				
	TOTAL FOR PROCESSING ROOM				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	LABORATORIES				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	100mm thick concrete plinth	sm	12		
B	50mm thick counter top and shelves	sm	12		
	Mesh fabric reinforcement				
C	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	24		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Soffits of counter tops and shelves	sm	12		
E	Edges: Plinths 75mm - 150mm girth	m	19		
F	Edges: of counter tops depth not exceeding 75mm	m	35		
	Screed: cement and sand (1:3) on concrete: wood floated finished				
G	20mm thick screed	sm	24		
	Supply and fix 20mm thick Medium Density Fibreboard (MDF), complete with runners and bearers including edge lipping, brackets or supports and all necessary fixings to;-				
H	Side boards	sm	4		
J	Divisions	sm	16		
K	Shelving	sm	35		
L	Bottoms	sm	35		
M	Top	sm	24		
N	150mm high Skirting	m	18		
	Door				
P	Supply and fix approved doors complete with frames, hinges and handles overall size 450mm x 730mm	No	33		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved granite with adhesive; to regular pattern: bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting laid on cement sand base (m/s)				
A	20mm thick granite top	sm	12		
	Prepare surfaces: apply three coats of approved varnish: on timber surfaces: to				
B	General timber surfaces	sm	239		
	Carried to Collection				
	COLLECTION From Page AQC / 27 From Page AQC/ 28(Above)				
	TOTAL				
	X2				
	TOTAL FOR LABORATORIES				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page AQC/ 26				
	From Page AQC/ 28(Above)				
	JOINERY & FIXTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	ACQUA CENTRE				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		AQC / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		AQC / 9		
	3. WALLING		AQC / 11		
	4. ROOF		AQC / 14		
	5. WINDOWS		AQC / 17		
	6. DOORS		AQC / 20		
	7. FINISHES		AQC / 24		
	8. JOINERY FITTINGS AND FIXTURES		AQC / 29		
	TOTAL ACQUA CENTRE CARRIED TO MAIN SUMMARY				

VISITOR'S CENTRE AND MUSEUM

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	65		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	308		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	308		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	462		
L	Excavate for column bases commencing from the reduced level depth exceeding 1.5m but not exceeding 3.0m deep	cm	6		
M	Excavate for strip foundation commencing from the reduced level depth exceeding 1.5m but not exceeding 3.0m deep	cm	22		
N	Extra over excavation in different classes of rock	cm	93		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item	1		
B	Allow for keep excavations free of water including any necessary pumping	Item	1		
C	Return, fill and ram selected soil in foundations	cm	113		
D	Remove surplus soil and dispose as directed	cm	489		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	71		
F	Ditto to column bases	sm	12		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	18		
H	Column bases	cm	5		
J	Foundation Columns	cm	3		
K	Ground beam	cm	12		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
L	150mm thick solid ground floor slab	sm	256		
	Mesh fabric reinforcement				
M	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	256		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted Bars	Kg	4560		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	36		
C	Sides of column starters	sm	37		
D	Sides of column bases	sm	15		
E	Sides and soffits of ground beam	sm	89		
F	Edges: ground floor slab 75mm - 150mm girth	m	93		
	Foundation Walling				
G	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	199		
	Imported Fill				
H	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	256		
J	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	376		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	256		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	256		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	256		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	28		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	28		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page VCM / 1				
	From Page VCM / 2				
	From Page VCM/ 3				
	From Page VCM / 4				
	From Page VCM / 5				
	From Page VCM / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Ground floor columns	cm	5		
B	Ring beam	cm	15		
C	Roof level columns	cm	5		
D	Roof beam	cm	15		
E	150 mm thick Suspended Slab	sm	126		
F	Staircase; steps and waist	cm	4		
G	150mm thick landing	sm	4		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
H	Assorted Bars	Kg	7680		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
J	Sides of ground floor columns	sm	62		
K	Sides and soffits of ring beam	sm	143		
L	Sides of roof level columns	sm	62		
M	Sides and soffits of roof beam	sm	167		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Formwork cont'd				
A	Soffits of Suspended Slab	sm	126		
B	Soffits of landing.	sm	4		
C	Sloping soffits of staircase.	sm	10		
D	Face of riser 75 - 150mm high.	m	55		
E	Sides of stringer 150 - 300mm high.	m	14		
F	Edge of landing 75 - 150mm high.	m	19		
G	Edge of Suspended 75 - 150mm high.	m	58		
	Carried to Collection				
	COLLECTION				
	From Page VCM / 8				
	From Page VCM / 9 (above)				
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	87		
B	100mm thick walls	sm	327		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm thick walls	m	15		
D	100mm thick walls	m	58		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
E	200mm thick walls	sm	186		
F	150mm thick walls	sm	27		
G	100mm thick walls	sm	63		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
H	200mm thick walls	m	33		
J	150mm thick walls	m	6		
K	100mm thick walls	m	11		
	Coping				
L	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	58		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING				
	(ALL PROVISIONAL)				
	Roof Structure				
	Structural Steelwork to BS 449				
	Structural mild steel sections in red oxide primer, including fabrication, hoisting and erecting; to include all necessary connections with steel connectors bolts & nuts, welding and the like: finished in three coats eggshell paint to all metal surfaces: in accordance with Structural Engineer's details and drawings: as described to				
	Unframed members: weldable				
A	Rafters: 200 x 75 x 3 mm thick RHS in mild steel	m	2275		
B	Purlins: 75 Dia mm thick CHS in mild steel	m	1219		
C	Compression Ring: 6 mm thickmild steel plate bent to 250mm Dia mm	No.	1		
	Eaves Finishes				
	Wrot celcured cypress				
D	50mm x 50mm runners	m	63		
E	50mm x 50mm bearers	m	52		
	Wrot celcured prime grade cypress				
F	250mm x 38mm fascia board and verge boards	m	63		
G	100mm x 25mm T & G eaves boarding fixed to bearers	sm	38		
	Painting and decorations				
	Knot, prime and stop; prepare surfaces and apply one undercoat and two coats prime grade quality polyurethrane lacquer varnish paint to:-				
H	General surfaces of eaves	sm	38		
J	Surfaces between 200mm and 300mm girth	m	63		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Roof Covering **24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details**				
A	Roof covering	sm	159		
	Under-roof sisalation				
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to;	sm	159		
	Carried to Collection				
	COLLECTION From Page VCM / 11 From Page VCM / 12 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	10		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	10		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	10		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	10		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	10		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	Window comprising 4 No. openable top hung light, overall size 3600 x 600 mm High **[W27]**	No	1		
B	Window comprising 2 No. openable top hung light, overall size 1800 x 600 mm High **[W28]**	No	2		
C	Window comprising 1 No. openable top hung light, overall size 1200 x 600 mm High **[W29]**	No	1		
D	Window comprising 1 No. fixed light, overall size 450 x 1200 mm High **[W30]**	No	2		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
E	Windows; pane size to Architect's details	sm	7		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
F	Windows; both sides measured	sm	14		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page VCM / 13				
	From Page VCM/ 14				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
	Supply and fix 50mm thick hollow core flush door; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule				
A	Supply and fix door overall size 1200 x 2400mm high fixed to 200 x 50 door frame (m.s) with matching beadings (m.s) ; all to Architect's detail drawings and approval **[D19]**		2		
B	Supply and fix door overall size 900 x 2100mm high fixed to 200 x 50 door frame (m.s); including 900 x 350 mm fun-light in 6 mm thick clear glass (m.s) fixed to framing with matching beadings (m.s) ; all to Architect's detail drawings and approval **[D21]**		3		
C	Supply and fix door overall size 900 x 2100mm high fixed to 200 x 50 door frame (m.s); including 900 x 350 mm fun-light in 6 mm thick clear glass (m.s) fixed to framing with matching beadings (m.s) ; all to Architect's detail drawings and approval **[D22]**		2		
	Frames and Linings				
	Wrot cypress: prime grade; selected				
D	200mm x 50mm door frames	m	42		
E	Ditto transomes	m	5		
F	50mm x 75mm Architrave: splayed	m	42		
G	25 mm dia. quadrant beading	m	42		
H	20 x 15 mm glazing beading	m	37		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
J	Over 100mm but not exceeding 200mm girth	m	42		
K	Not exceeding 100mm girth	m	84		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
A	Over 100mm but not exceeding 200mm girth	m	42		
B	Not exceeding 100mm girth	m	84		
C	General timber surfaces: doors	sm	31		
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
D	Doors; pane size to Architect's details	sm	2		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
E	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	13 1/2		
F	Three lever mortice locks with furniture	No	7		
G	Polished stainless steel door handles	No	18		
H	Rubber door stopper	No	9		
J	2mm thick satin stainless steel kick plate screwed to door surfaces	No	18		
K	2mm thick satin stainless steel push plate screwed to door surfaces	No	18		
	Frameless Glazed Doors				
	Supply and fix frameless glazed doors in12 mm thick toughened glass; secured to opening using all necessary accessories including waterproofing all joints using approved silicon sealing compounds with all the necesarry ironmongery and fittings; all to Architects approval and detail drawings				
L	Single leaf door size 2400 x 2400 mm high **[D20]**	No	2		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page VCM / 16				
	From Page VCM/ 17				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	EXTERNAL FINISHES				
	External wall finishes				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
A	Concrete surfaces externally; finished smooth	sm	265		
B	Masonry surfaces externally; finished smooth	sm	370		
	Key pointing to horizontal joints and flushing to vertical joints; in cement and sand (1:3) mortar: as described to				
C	Masonry surfaces externally; finished smooth	sm	163		
	Floor Finishes				
	Cement and sand (1:3) mortar: to screeds, backings, beds etc: in				
D	32mm Thick bed screed to receive Clay floor tiles (m/s)	sm	126		
	Steps finishes				
	32mm thick screeds: Cement and sand (1:3) mortar: wood-floated to Ceramic floor tiles (m.s); as described to				
E	Treads to steps, 400mm wide	sm	9		
F	Risers to steps, 150mm high	sm	3		
	Ceramic floor tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
G	400mm x 400mm x 8mm thick tiles	sm	12		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Open terrace Finishes				
	Beds or Backing				
	Bed; cement and sand (1:4); waterproof; Sika1 rate of 1.5 Kg per 50 kg of cement or equal and approved; steel trowelled				
A	Average 75 mm thick waterproofed cement and sand screed laid to crossfalls on concrete floor slab (m.s) finished to receive APP waterproofing membrane (m.s)	sm	126		
B	150mm high x 20mm thick ditto to masonry/concrete upstands	m	57		
C	Dish screed around 75 mm diameter "Fulbora" rainwater outlet	No	2		
	Waterproofing				
	Attactic Poly-Prolylene (APP) waterproofing membrane 4 mm thick as manufactured by Messrs. Italbuild Import Ltd. or other equal and approved manufacturer laid in ccordance with manufacturer's printed instructions by an approved sub-contractor to give 10 years guarantee				
D	Over 300 mm wide; to falls, crossfalls or sloping not exceeding 15 degrees from horizontal; to surface of screeded slab (m.s)	sm	126		
E	Skirting including turning into groove,height 150mm	sm	57		
F	Labour and material for working roofing felt around 75 mm diameter fulbora type roof outlets	sm	2		
	Protective screeds as described				
G	40mm Thick screed laid over waterproof to receive finishes (m.s.) - Flat roof	sm	126		
H	20mm thick x 150mm high skirting to receive concrete tile (m/s)	sm	57		
J	Protective screed on water proofing around 75 mm diameter "Fulbora" rainwater outlet	sm	2		
	Concrete floor tiles				
	Supply and fix 15 mm thick interlocking concrete tiles: laid on protective screed (m/s) in approved tile adhesive: in zero joints: as described to:-				
K	Open Terrace	sm	126		
L	150mm high tile skirting	sm	57		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	INTERNAL FINISHES				
	Wall Finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
A	Concrete surfaces, internally	sm	296		
B	Masonry surfaces, internally	sm	962		
C	Jambs and reveals: 100 - 200 mm girth	sm	85		
	Painting and decoration				
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
D	Plastered concrete surfaces, internally	sm	296		
E	Plastered walls surfaces, internally	sm	962		
F	Jambs and reveals: 100 - 200 mm girth	sm	85		
	Floor Finishes				
	Cement and sand (1:3) mortar: to screeds, backings, beds etc: in				
G	32mm Thick bed screed to receive floor tiles (m/s)	sm	233		
	Ceramic floor tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
H	400mm x 400mm x 8mm thick tiles	sm	233		
J	Skirting, 150 mm high	sm	152		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	STAIRCASE FINISHES				
	Plaster: 9 mm first coat of cement, lime putty and sand (1:2:9): 4 mm second coat of cement lime putty and sand (1:1:6): steel trowelled: generally to				
A	Sloping soffits of staircases & strings	sm	14		
B	Soffits of landings	sm	4		
	Cement and sand (1:3) mortar on concrete: to screeds, backings, beds etc: in				
	32 mm thick: to receive tiles: generally to				
C	Landing	sm	4		
D	150mm high staircase risers	m	32		
E	300mm wide staircase treads	m	29		
	Ceramic floor tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
F	Landing	sm	4		
G	150mm high ceramic tile staircase risers	m	32		
H	300mm wide ceramic tile staircase treads	m	29		
	Painting and Decorations				
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
J	Plastered sloping soffits of staircases & strings	sm	14		
K	Plastered soffits of landings	sm	4		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Staircase balustrading				
A	900mm high balustrading in mild steel steel comprising 25 x 50mm diameter mild steel rectangular hollow section(RHS) handrail, 50mm x 50mm SHS balusters (standards) at 1000mm centres with one end grouted to concrete floor and other end welded to handrail; 25 x 6mm flat profile at 100mm centers; powder coated to approval; all as per architect's detail	m	8		
	Ceiling Finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
B	Soffits of suspended slab	sm	126		
	Painting and decoration				
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
C	Soffits of suspended slab	sm	126		
	Wrot celcured cypress				
D	100mm x 25mm T & G eaves boarding fixed to and including brandering	sm	25		
E	75mm coved cornice	m	35		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
F	Softboard ceiling internally	sm	25		
G	Surfaces 0 - 100mm girth; cornice	m	35		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page VCM / 19				
	From Page VCM/ 20				
	From Page VCM/ 21				
	From Page VCM/ 22				
	From Page VCM/ 23 (Above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	VISITOR'S CENTER AND MUSEUM				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		VCM / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		VCM / 9		
	3. WALLING		VCM/ 10		
	4. ROOF		VCM / 12		
	5. WINDOWS		VCM / 15		
	6. DOORS		VCM / 18		
	7. FINISHES		VCM / 24		
	TOTAL VISITOR'S CENTER AND MUSEUM CARRIED TO MAIN SUMMARY				

RESTAURANT

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	78		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	3		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	2		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	822		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	822		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	611		
L	Excavate for column bases commencing from the reduced level not exceeding 1.5m deep	cm	23		
M	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	35		
N	Extra over excavation in different classes of rock	cm	182		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	517		
D	Remove surplus soil and dispose as directed	cm	152		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	61		
F	Ditto to column bases	sm	54		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	17		
H	Column bases	cm	19		
J	Columns	cm	3		
K	Ground beam	cm	9		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
L	Steps	cm	8		
M	150mm thick solid ground floor slab	sm	368		
N	150mm ramp	sm	10		
	Mesh fabric reinforcement				
P	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	368		
Q	Ditto; to ramps	sm	10		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	6720		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	62		
C	Sides of column starters	sm	45		
D	Sides of column bases	sm	47		
E	Soffits of ramp	sm	10		
F	Sides and soffits of ground beam	sm	123		
G	Edges: ground floor slab 75mm - 150mm girth	m	85		
	Foundation Walling				
H	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	246		
	Imported Fill				
J	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	345		
K	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	519		
	Blinding				
L	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	345		
	Anti-termite treatment				
M	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	345		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	DPM				
A	Gauge 1000 polythene damp proof membrane	sm	368		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
B	Plinths: externally	sm	39		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
C	Plinths: externally	sm	39		
	Carried to Collection				
	COLLECTION				
	From Page Rst / 1				
	From Page Rst/ 2				
	From Page Rst/ 3				
	From Page Rst / 4				
	From Page Rst / 5				
	From Page Rst / 6 (Above)				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Columns	cm	6		
B	Ring beam and lintel	cm	14		
C	Gutter beam	cm	36		
D	Roof beam	cm	7		
E	100mm thick vanity tops	sm	6		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
F	Assorted bars	Kg	7560		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
G	Sides of columns	sm	89		
H	Sides and soffits of ring beam and lintels	sm	166		
J	Sides and soffits gutter beam	sm	363		
K	Sides and soffits of roof beam	sm	80		
L	Soffits of vanity tops	sm	6		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	214		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
B	200mm wide	m	86		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
C	200mm thick walls	sm	141		
D	150mm thick walls	sm	47		
E	100mm thick walls	sm	68		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
F	200mm wide	m	47		
G	150mm wide	m	16		
H	100mm wide	m	23		
	Aluminium glazed Partitions				
J	Fabricate supply and fix 50mm x 50mm approved powder coated aluminium in approved framing with including 8mm thick laminated safety glass fixed with glass beading all to architects details and approval	sm	14		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Concrete Vents				
A	300mm x 300mm precast concrete vents blocks laid and jointed with cement and sand mortar; painted to detail; all to Architect's details and specifications	sm	27		
	Coping				
B	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	51		
	Carried to Collection				
	COLLECTION				
	From Page Rst / 8				
	From Page Rst/ 9 (Above)				
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING				
	(ALL PROVISIONAL)				
	Roof Covering				
	24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details				
A	Roof covering	sm	352		
	Under-roof sisalation				
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to;	sm	352		
	Tensile shade Canopy				
C	Supply, fabricate and fix tensile sail shade canopy system to manufacturer's specification comprising high-density UV stabilized waterproof HDPE/PVC shade fabric, complete with galvanized mild steel support posts, edge cables, tensioning accessories, base plates, anchor bolts, fixing brackets, turnbuckles, stainless steel fittings, all necessary accessories, to architects approval	sm	175		
	Unframed mild steel work as described complete with bolts, nuts, washers, splash plates and base plates; including drilling, hoisting and placing at roof level, one coat red oxide primer before fixing and final two coats paint on completion to approval				
	TRUSS T1 (2No.)				
D	75mm x 75mm x 4mm thick RHS (8.5Kg/m)	Kgs	306		
E	100mm x 75mm x 13.5mm thick SHS (13.5Kg/m)	Kgs	559		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	TRUSS T2 (2No.)				
A	75mm x 75mm x 4mm thick RHS (8.5Kg/m)	Kgs	306		
B	100mm x 75mm x 13.5mm thick SHS (13.5Kg/m)	Kgs	559		
	TRUSS T3 (2No.)				
C	75mm x 75mm x 4mm thick RHS (8.5Kg/m)	Kgs	104		
D	100mm x 75mm x 13.5mm thick SHS (13.5Kg/m)	Kgs	314		
	TRUSS T4 (4No.)				
E	75mm x 75mm x 4mm thick RHS (8.5Kg/m)	Kgs	249		
F	100mm x 75mm x 13.5mm thick SHS (13.5Kg/m)	Kgs	827		
G	Zed purlins 150mm x 50 mm x 25mm x 2mm (6.14kg/m)	Kgs	1256		
H	12mm diameter anti-sag rods (0.888Kg/m)	Kgs	25		
	Rainwater goods				
	610mm girth x 2mm thick mild steel gutter: fixed to fascia with and including steel flat brackets at 1500 mm (maximum) centres: holes for down pipes as necessary: closed ends				
J	Mild steel gutter to details	m	57		
	Extra over rainwater goods for :-				
K	100mm diameter outlet	No	8		
L	Stopped end	No	4		
	Wrot celcured cypress				
M	100mm x 25mm T & G eaves boarding fixed to bearers	sm	48		
N	50mm x 50mm runners	m	78		
P	50mm x 50mm bearers	m	79		
	Wrot celcured prime grade cypress				
Q	250mm x 38mm fascia board and verge boards	m	78		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
A	General surfaces of eaves	sm	48		
B	Surfaces between 200mm and 300mm girth	m	78		
	Carried to Collection				
	COLLECTION				
	From Page Rst / 10				
	From Page Rst / 11				
	From Page Rst / 12 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	29		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	29		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	29		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	29		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	29		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	900mm width x 1000mm overall size	No	15		
B	1150mm width x 3150mm overall size	No	12		
C	3600mm width x 1000mm overall size	No	2		
D	4900mm width x 1800mm overall size	No	1		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
E	Windows; pane size to Architect's details	sm	73		
	8mm thick laminated glass and glazing to casements with linseed putty				
F	Windows; pane size to Architect's details	sm	34		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
G	Windows; both sides measured	sm	145		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page Rst / 13				
	From Page Rst / 14 (Above)				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
A	Supply and fix 50mm thick hollow core flush door; overall size 800mm x 2000 mm high; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule (D10)	No	5		
B	Ditto 1000mm x 2000mm (D11)	No	2		
C	Ditto 900mm x 2400mm with clear laminated glass vision panel (D13, D15)	No	9		
	Solid Timber Doors				
D	50mm thick sibgle leaf solid panelled mvule door comprising of 200 x 50mm thick polished mahogany top and bottom rails, 150 x 50mm thick polished mahogany intermediate rails and hinge stile overall size 900mm x 2400mm high; to Architect's door schedule (D25)	No	5		
	Wrot cypress: prime grade; selected				
E	200mm x 50mm thick door frames	m	99		
F	Ditto transomes	m	99		
G	50mm x 75mm Architrave: splayed	m	99		
H	12mm diameter hardwood quodrant	m	99		
J	225mm x 50mm thick rebated polished mvule door	m	36		
K	Ditto transomes	m	36		
L	75mm x 25mm Architrave: splayed	m	36		
M	12mm diameter hardwood quodrant	m	36		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
N	Over 100mm but not exceeding 200mm girth	m	135		
P	Not exceeding 100mm girth	m	135		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
A	Over 100mm but not exceeding 200mm girth	m	270		
B	Not exceeding 100mm girth	m	270		
C	General timber surfaces: doors	sm	104		
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
D	Doors; pane size to Architect's details	sm	9		
	Metal Doors				
	Supply and fix the following steel door; complete with all necessary ironmongery, steel sections, frame, mullion and stiles (refer to Architect's details)				
E	1400mm x 3150mm pressed steel double leaf door complete with; 75mm x 25mm vertical stile; 75mm x 25mm to and bottom stile; 8mm thick laminated safety glass complete with frames ; hinges, stays, fasteners, assembled and fixed to opening including cutting and pinning lugs; to Architect's detail and specification(D16)	No	12		
	Aluminium Framed Door				
	Supply and fix aluminium framed doors with approved powder coated aluminium in framing in sections of size 100mm x 50mm x 2mm thick fixed to wall / beam / column around openings, including glazing with 8mm thick laminated glass; secured to the framing using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds with all the necesarry ironmongery and fittings; all to Architect's door schedules' details and approval				
F	Single leaf doors; overall size 800mm x 2100mm overall height (D6)	No	1		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
G	Doors; both sides measured	sm	106		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
A	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	31 1/2		
B	Stainless steel (304) thumb turn indicator locks	No	7		
C	Three lever mortice locks with furniture	No	14		
D	Polished stainless steel door handles	No	42		
E	Rubber door stopper	No	21		
F	2mm thick satin stainless steel kick plate screwed to door surfaces	No	42		
G	2mm thick satin stainless steel push plate screwed to door surfaces	No	21		
H	Aluminium coat hanger	No	21		
	Carried to Collection				
	COLLECTION From Page Rst / 15 From Page Rst/ 16 From Page Rst/ 17 (Above)				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	324		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
B	400mm x 400mm x 8mm thick tiles	sm	324		
C	150mm high skirting	m	217		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	726		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive ceramic tiles (m.s.)	sm	134		
F	Vanity tops	sm	6		
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
G	400mm x 400mm x 8mm thick tiles	sm	134		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
H	Walls	sm	726		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
A	Walls and concrete surfaces	sm	214		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
B	Externally to walls and concrete surfaces	sm	214		
	CEILING & BEAM FINISHES				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
C	Sides and soffits of beams	sm	609		
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
D	Ceiling: patterns to Architect's approval and detail	sm	156		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
E	Beams	sm	609		
	STEPS AND RAMP AND FINISHES				
	Screed: cement and sand (1:3): on concrete wood floated				
F	20mm thick: to ramps	sm	10		
G	20mm thick: to 300mm wide treads to receive ceramic tiles	m	130		
H	20mm thick: 150mm high risers ditto	m	195		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4);				
A	300mm wide treads	sm	130		
B	150mm high risers	m	195		
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
C	20mm thick: to ramps	m	10		
D	20mm thick; to vanity tops	sm	6		
	Carried to Collection				
	COLLECTION				
	From Page Rst / 19				
	From Page Rst/ 20				
	From Page Rst/ 21 (Above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 8; JOINERY & FIXTURES				
	CONCRETE SHELVES				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	38mm thick concrete shelves	sm	96		
	Mesh fabric reinforcement				
B	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	96		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
C	Soffits of shelves	sm	96		
D	Edges: of shelves depth not exceeding 75mm	m	182		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive terrazzo (m.s.)	sm	192		
	Terrazzo				
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
F	20mm thick; shelves	sm	192		
	BUFFET COUNTER				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	100mm thick concrete plinth	sm	7		
H	50mm thick counter top and shelves	sm	11		
	Mesh fabric reinforcement				
J	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	18		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
A	Soffits of counter tops and shelves	sm	11		
B	Edges: Plinths 75mm - 150mm girth	m	14		
C	Edges: of counter tops depth not exceeding 75mm	m	21		
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
D	100mm thick walls	sm	10		
	Screed: cement and sand (1:3) on concrete: wood floated finished				
E	20mm thick screed	sm	18		
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
F	Walls	sm	20		
	Supply and fix 20mm thick Medium Density Fibreboard (MDF), complete with runners and bearers including edge lipping, brackets or supports and all necessary fixings to;-				
G	Side boards	sm	2		
H	Divisions	sm	3		
J	Shelving	sm	2		
K	Bottoms	sm	3		
L	150mm high Skirting	m	5		
	Door				
M	Supply and fix approved doors complete with frames, hinges and handles overall size 450mm x 730mm	No	7		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Drawers				
A	Supply and fix Drawer size 700 x 600 x 245mm high, constructed of 20mm thick MDF bottom, top, sides and divisions all properly glued, housed and blocked together including all necessary grooves fixing to position and apply thtree coats of approved varnish as per architects approval	No	3		
B	Ditto; Drawer size 300mm x 600mm x245mm high	No	3		
	Terrazzo				
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
C	20mm thick to shelves,counter tops	sm	8		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
D	400mm x 400mm x 8mm thick tiles	sm	4		
E	150mm high skirting	m	9		
	Supply and fix approved granite with adhesive; to regular pattern: bedding and jointing in cement mortar (1:4) grouting joints with proprietary grouting laid on cement sand base (m/s)				
F	20mm thick granite top	sm	3		
	Prepare surfaces: apply three coats of approved varnish: on timber surfaces: to				
G	General timber surfaces	sm	22		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
H	Walls	sm	20		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Cabinets **Purpose-made stainless steel cabinets fabricated from 1.2mm thick stainless steel sheet, including doors, including doors, shelves stiffeners, hinges, locks, handles, and all necessary accessories, fixed to wall with brackets and plugs, complete as specified all to architectes details and specifications**				
A	600mm x 900mm high	No	14		
B	1200mm x 450mm high open shelves	No	22		
	Carried to Collection				
	COLLECTION From Page Rst / 22 From Page Rst/ 23 From Page Rst/ 24 From Page Rst/ 25 (Above)				
	JOINERY & FIXTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	RESTAURANT				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		Rst / 6		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		Rst /7		
	3. WALLING		Rst / 9		
	4. ROOF		Rst/ 12		
	5. WINDOWS		Rst / 15		
	6. DOORS		Rst / 18		
	7. FINISHES		Rst / 21		
	8. JOINERY FITTINGS AND FIXTURES		Rst / 25		
	TOTAL RESTAURANT CARRIED TO MAIN SUMMARY				

WORKSHOP 1

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	56		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	162		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	162		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	243		
L	Excavate for column bases commencing from the reduced level not exceeding 1.5m deep	cm	3		
M	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	9		
N	Extra over excavation in different classes of rock	cm	128		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	183		
D	Remove surplus soil and dispose as directed	cm	72		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	38		
F	Ditto to column bases	sm	8		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	10		
H	Column bases	cm	3		
J	Columns	cm	2		
K	Ground beam	cm	4		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
L	150mm thick solid ground floor slab	sm	131		
M	150mm ramp	sm	9		
	Mesh fabric reinforcement				
N	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	131		
P	Ditto; to ramps	sm	9		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	2280		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	13		
C	Sides of column starters	sm	23		
D	Sides of column bases	sm	12		
E	Soffits of ramp	sm	9		
F	Sides and soffits of ground beam	sm	50		
G	Edges: ground floor slab 75mm - 150mm girth	m	51		
	Foundation Walling				
H	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	93		
	Imported Fill				
J	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	121		
K	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	182		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	121		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	121		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	131		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	23		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	23		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page WKS1 / 1				
	From Page WKS1 / 2				
	From Page WKS1/ 3				
	From Page WKS1 / 4				
	From Page WKS1 / 5				
	From Page WKS1 / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Columns	cm	3		
B	Ring beam and lintel	cm	9		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
C	Assorted bars	Kg	1440		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Sides of columns	sm	34		
E	Sides and soffits of ring beam and lintels	sm	112		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	156		
B	200mm thick gable walls	sm	20		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm wide	m	62		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
D	200mm thick walls	sm	11		
E	150mm thick walls	sm	35		
F	100mm thick walls	sm	5		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
G	200mm thick walls	m	10		
H	150mm thick walls	m	12		
J	100mm thick walls	m	2		
	Aluminium glazed Partitions				
K	Fabricate supply and fix 50mm x 50mm approved powder coated aluminium in approved framing with including 8mm thick laminated safety glass fixed with glass beading all to architects details and approval	sm	19		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Concrete Vents				
A	300mm x 300mm precast concrete vents blocks laid and jointed with cement and sand mortar; painted to detail; all to Architect's details and specifications	sm	8		
	Coping				
B	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	69		
	Carried to Collection				
	COLLECTION				
	From Page WKS1 / 9				
	From Page WKS1 / 10				
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING **(ALL PROVISIONAL)** **Roof Covering** **24 Gauge concealed interlocking roof sheeting fixed to internal timber purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details**				
A	Roof covering	sm	185		
	Under-roof sisalation				
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to; ***The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes***	sm	185		
C	200mm x 50mm purlins	m	152		
D	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	36		
E	100mm x 50mm common rafters	m	264		
F	200mm x 50mm ridge board	m	19		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Timber Trusses				
	The following in 10 No. trusses				
A	150mm x 50mm principal rafters	m	91		
B	100mm x 50mm struts and ties	m	150		
C	150mm x 50mm tie beam	m	70		
	UPVC rainwater goods				
D	125mm x 150mm box gutter fixed with manufacturer's approved brackets at 600mm centres	m	37		
	Extra over rainwater goods for :-				
E	100mm diameter outlet	No	8		
F	Stopped end	No	4		
	Wrot celcured prime grade cypress				
G	250mm x 38mm fascia board and verge boards	m	55		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
H	Surfaces between 200mm and 300mm girth	m	55		
	Carried to Collection				
	COLLECTION				
	From Page WKS1 / 11				
	From Page WKS1 / 12 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	20		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	20		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	20		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	20		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	20		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	600mm width x 2400mm overall size	No	3		
B	3000mm width x 1000mm overall size	No	3		
C	3600mm width x 2000mm overall size	No	1		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
D	Windows; pane size to Architect's details	sm	18		
	6mm thick obscured glass and glazing to casements with linseed putty				
E	Windows to washroom areas; pane size to Architect's details	sm	3		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
F	Windows; both sides measured	sm	42		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page WKS1 / 13				
	From Page WKS1/ 14 (Above)				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
A	Supply and fix 50mm thick hollow core flush door; overall size 900mm x 2400 mm high; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule (D8)	No	3		
B	Ditto 1000mm x 2400mm (D12)	No	1		
C	Ditto 800mm x 2400mm (D10)	No	2		
	Wrot cypress: prime grade; selected				
D	200mm x 50mm thick veneered postformed door frames	m	38		
E	Ditto transomes	m	38		
F	50mm x 75mm Architrave: splayed	m	38		
G	12mm diameter hardwood quodrant	m	38		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
H	Over 100mm but not exceeding 200mm girth	m	38		
J	Not exceeding 100mm girth	m	38		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
K	Over 100mm but not exceeding 200mm girth	m	76		
L	Not exceeding 100mm girth	m	76		
M	General timber surfaces: doors	sm	29		
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
N	Doors; pane size to Architect's details	sm	2		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Aluminium Framed Door				
	Supply and fix aluminium framed doors with approved powder coated aluminium in framing in sections of size 100mm x 50mm x 2mm thick fixed to wall / beam / column around openings, including glazing with 8mm thick laminated glass; secured to the framing using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds with all the necesarry ironmongery and fittings; all to Architect's door schedules' details and approval				
A	Single leaf doors; overall size 800mm x 2100mm overall height (D6)	No	1		
	Galvanised Steel Roller Shutters				
	Supply and install industrial type motorized hot dipped galvanised roller shutter face mounted doors with 75mm x 4mm solid steel slats. Supplied and installed complete including all necessary frames, channel guides, canopy covers, fixing lugs, ironmongery and emergency manual opening mechanism. Including sealing all around the perimeter of the door with silicone sealant on a backing cord with minimum joint size 10mm x 10mm internally and externally; complete with all necessary ironmongery and fixed in position to Architect's details				
B	Purpose made mild steel roller shutter door 3600mm x 3000mm; complete with frame; one coat red oxide primer; all ironmongery and fixing accessories; as detailed in the Architect's schedule (D13)	No	2		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
C	Doors; both sides measured	sm	44		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
A	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	10 1/2		
B	Stainless steel (304) thumb turn indicator locks	No	3		
C	Three lever mortice locks with furniture	No	3		
D	Polished stainless steel door handles	No	12		
E	Rubber door stopper	No	7		
F	2mm thick satin stainless steel kick plate screwed to door surfaces	No	12		
G	2mm thick satin stainless steel push plate screwed to door surfaces	No	6		
H	Aluminium coat hanger	No	7		
	Carried to Collection				
	COLLECTION From Page WKS1 / 16 From Page WKS1/ 17 From Page WKS1/ 18 (Above)				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	118		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
B	400mm x 400mm x 8mm thick tiles	sm	23		
C	150mm high skirting	m	41		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	278		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
E	Walls	sm	278		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
F	Walls to receive ceramic tiles (m.s.)	sm	8		
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
G	400mm x 400mm x 8mm thick tiles	sm	8		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
A	Walls and concrete surfaces	sm	176		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
B	Externally to walls and concrete surfaces	sm	176		
	CEILING & BEAM FINISHES				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
C	Sides and soffits of beams	sm	112		
	Accoustic Celing				
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
D	Ceiling: patterns to Architect's approval and detail	sm	28		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
E	Beams	sm	112		
	RAMP FINISHES				
	Screed: cement and sand (1:3): on concrete wood floated				
F	20mm thick: to ramps	sm	9		
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
G	20mm thick: to ramps	m	9		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	**Ramp/ Steps railing** 900mm high balustrading in mild steel steel comprising 25 x 50mm diameter mild steel rectangular hollow section(RHS) handrail, 50mm x 50mm SHS balusters (standards) at 1000mm centres with one end grouted to concrete floor and other end welded to handrail; 25 x 6mm flat profile at 100mm centers; powder coated to approval; all as per architect's detail	m	5		
	Carried to Collection				
	COLLECTION From Page WKS1 / 19 From Page WKS1 / 20 From Page WKS1 / 21 (Above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	WORKSHOP 1				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		WKS1 / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		WKS 1 /8		
	3. WALLING		WKS 1 / 10		
	4. ROOF		WKS1 / 12		
	5. WINDOWS		WKS1 / 15		
	6. DOORS		WKS1 / 18		
	7. FINISHES		WKS1 / 21		
	TOTAL WORKSHOP 1 CARRIED TO MAIN SUMMARY				

WORKSHOP 2

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	56		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	162		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	162		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	243		
L	Excavate for column bases commencing from the reduced level not exceeding 1.5m deep	cm	3		
M	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	9		
N	Extra over excavation in different classes of rock	cm	128		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	183		
D	Remove surplus soil and dispose as directed	cm	72		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	38		
F	Ditto to column bases	sm	8		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	10		
H	Column bases	cm	3		
J	Columns	cm	2		
K	Ground beam	cm	4		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
L	150mm thick solid ground floor slab	sm	131		
M	150mm ramp	sm	9		
	Mesh fabric reinforcement				
N	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	131		
P	Ditto; to ramps	sm	9		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	2280		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	13		
C	Sides of column starters	sm	23		
D	Sides of column bases	sm	12		
E	Soffits of ramp	sm	9		
F	Sides and soffits of ground beam	sm	50		
G	Edges: ground floor slab 75mm - 150mm girth	m	51		
	Foundation Walling				
H	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	93		
	Imported Fill				
J	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	121		
K	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	182		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	121		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	121		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	131		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	23		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	23		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page WKS2 / 1				
	From Page WKS2 / 2				
	From Page WKS2/ 3				
	From Page WKS2 / 4				
	From Page WKS2 / 5				
	From Page WKS2 / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 30N/mm² at 28 days; in				
A	Columns	cm	3		
B	Ring beam and lintel	cm	9		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
C	Assorted bars	Kg	1440		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Sides of columns	sm	34		
E	Sides and soffits of ring beam and lintels	sm	112		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	156		
B	200mm thick gable walls	sm	20		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm wide	m	62		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
D	200mm thick walls	sm	11		
E	150mm thick walls	sm	35		
F	100mm thick walls	sm	5		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
G	200mm thick walls	m	10		
H	150mm thick walls	m	12		
J	100mm thick walls	m	2		
	Aluminium glazed Partitions				
K	Fabricate supply and fix 50mm x 50mm approved powder coated aluminium in approved framing with including 8mm thick laminated safety glass fixed with glass beading all to architects details and approval	sm	19		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Concrete Vents				
A	300mm x 300mm precast concrete vents blocks laid and jointed with cement and sand mortar; painted to detail; all to Architect's details and specifications	sm	8		
	Coping				
B	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	69		
	Carried to Collection				
	COLLECTION				
	From Page WKS2 / 9				
	From Page WKS2 / 10				
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING **(ALL PROVISIONAL)** **Roof Covering** **24 Gauge concealed interlocking roof sheeting fixed to internal timber purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details**				
A	Roof covering	sm	185		
	Under-roof sisalation				
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to; ***The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes***	sm	185		
C	200mm x 50mm purlins	m	152		
D	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	36		
E	100mm x 50mm common rafters	m	264		
F	200mm x 50mm ridge board	m	19		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Timber Trusses				
	The following in 10 No. trusses				
A	150mm x 50mm principal rafters	m	91		
B	100mm x 50mm struts and ties	m	150		
C	150mm x 50mm tie beam	m	70		
	UPVC rainwater goods				
D	125mm x 150mm box gutter fixed with manufacturer's approved brackets at 600mm centres	m	37		
	Extra over rainwater goods for :-				
E	100mm diameter outlet	No	8		
F	Stopped end	No	4		
	Wrot celcured prime grade cypress				
G	250mm x 38mm fascia board and verge boards	m	55		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
H	Surfaces between 200mm and 300mm girth	m	55		
	Carried to Collection				
	COLLECTION				
	From Page WKS2 / 11				
	From Page WKS2 / 12 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	20		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	20		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	20		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	20		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	20		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	600mm width x 2400mm overall size	No	3		
B	3000mm width x 1000mm overall size	No	3		
C	3600mm width x 2000mm overall size	No	1		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
D	Windows; pane size to Architect's details	sm	18		
	6mm thick obscured glass and glazing to casements with linseed putty				
E	Windows to washroom areas; pane size to Architect's details	sm	3		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
F	Windows; both sides measured	sm	42		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page WKS2 / 13				
	From Page WKS2/ 14 (Above)				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
A	Supply and fix 50mm thick hollow core flush door; overall size 900mm x 2400 mm high; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule (D8)	No	3		
B	Ditto 1000mm x 2400mm (D12)	No	1		
C	Ditto 800mm x 2400mm (D10)	No	2		
	Wrot cypress: prime grade; selected				
D	200mm x 50mm thick veneered postformed door frames	m	38		
E	Ditto transomes	m	38		
F	50mm x 75mm Architrave: splayed	m	38		
G	12mm diameter hardwood quodrant	m	38		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
H	Over 100mm but not exceeding 200mm girth	m	38		
J	Not exceeding 100mm girth	m	38		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
K	Over 100mm but not exceeding 200mm girth	m	76		
L	Not exceeding 100mm girth	m	76		
M	General timber surfaces: doors	sm	29		
	Glazing				
	6mm thick clear glass with safety film to door fixed with glass beading				
N	Doors; pane size to Architect's details	sm	2		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Aluminium Framed Door				
	Supply and fix aluminium framed doors with approved powder coated aluminium in framing in sections of size 100mm x 50mm x 2mm thick fixed to wall / beam / column around openings, including glazing with 8mm thick laminated glass; secured to the framing using approved glazing strips and glazing beading including waterproofing all joints using approved silicon sealing compounds with all the necesarry ironmongery and fittings; all to Architect's door schedules' details and approval				
A	Single leaf doors; overall size 800mm x 2100mm overall height (D6)	No	1		
	Galvanised Steel Roller Shutters				
	Supply and install industrial type motorized hot dipped galvanised roller shutter face mounted doors with 75mm x 4mm solid steel slats. Supplied and installed complete including all necessary frames, channel guides, canopy covers, fixing lugs, ironmongery and emergency manual opening mechanism. Including sealing all around the perimeter of the door with silicone sealant on a backing cord with minimum joint size 10mm x 10mm internally and externally; complete with all necessary ironmongery and fixed in position to Architect's details				
B	Purpose made mild steel roller shutter door 3600mm x 3000mm; complete with frame; one coat red oxide primer; all ironmongery and fixing accessories; as detailed in the Architect's schedule (D13)	No	2		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
C	Doors; both sides measured	sm	44		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
A	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	10 1/2		
B	Stainless steel (304) thumb turn indicator locks	No	3		
C	Three lever mortice locks with furniture	No	3		
D	Polished stainless steel door handles	No	12		
E	Rubber door stopper	No	7		
F	2mm thick satin stainless steel kick plate screwed to door surfaces	No	12		
G	2mm thick satin stainless steel push plate screwed to door surfaces	No	6		
H	Aluminium coat hanger	No	7		
	Carried to Collection				
	COLLECTION From Page WKS2 / 16 From Page WKS2/ 17 From Page WKS2/ 18 (Above)				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	118		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
B	400mm x 400mm x 8mm thick tiles	sm	23		
C	150mm high skirting	m	41		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	278		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
E	Walls	sm	278		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
F	Walls to receive ceramic tiles (m.s.)	sm	8		
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
G	400mm x 400mm x 8mm thick tiles	sm	8		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
A	Walls and concrete surfaces	sm	176		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
B	Externally to walls and concrete surfaces	sm	176		
	CEILING & BEAM FINISHES				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
C	Sides and soffits of beams	sm	112		
	Accoustic Celing				
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
D	Ceiling: patterns to Architect's approval and detail	sm	28		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
E	Beams	sm	112		
	RAMP FINISHES				
	Screed: cement and sand (1:3): on concrete wood floated				
F	20mm thick: to ramps	sm	9		
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
G	20mm thick: to ramps	m	9		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	**Ramp/ Steps railing** 900mm high balustrading in mild steel steel comprising 25 x 50mm diameter mild steel rectangular hollow section(RHS) handrail, 50mm x 50mm SHS balusters (standards) at 1000mm centres with one end grouted to concrete floor and other end welded to handrail; 25 x 6mm flat profile at 100mm centers; powder coated to approval; all as per architect's detail	m	5		
	Carried to Collection				
	COLLECTION From Page WKS2 / 19 From Page WKS2 / 20 From Page WKS2 / 21 (Above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	WORKSHOP 2				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		WKS2 / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		WKS 2 /8		
	3. WALLING		WKS 2 / 10		
	4. ROOF		WKS2 / 12		
	5. WINDOWS		WKS2/ 15		
	6. DOORS		WKS2 / 18		
	7. FINISHES		WKS2 / 21		
	TOTAL WORKSHOP 2 CARRIED TO MAIN SUMMARY				

POWER HOUSE

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	43		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	116		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	116		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	174		
L	Excavate for column bases commencing from the reduced level not exceeding 1.5m deep	cm	3		
M	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	12		
N	Extra over excavation in different classes of rock	cm	95		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	104		
D	Remove surplus soil and dispose as directed	cm	85		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	41		
F	Ditto to column bases	sm	8		
G	Cable trench	sm	14		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
H	Strip footing	cm	10		
J	Column bases	cm	3		
K	Columns	cm	2		
L	Ground beam	cm	6		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
M	Cable trench	cm	5		
N	150mm thick solid ground floor slab	sm	107		
P	150mm ramp	sm	12		
	Mesh fabric reinforcement				
Q	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	107		
R	Ditto; to ramps	sm	12		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	3120		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	35		
C	Sides of column starters	sm	19		
D	Sides of column bases	sm	12		
E	Soffits of ramp	sm	12		
F	Sides and soffits of ground beam	sm	58		
G	Sides of cable trench	sm	57		
H	Edges: ground floor slab 75mm - 150mm girth	m	51		
	Foundation Walling				
J	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	142		
	Imported Fill				
K	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	89		
L	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	134		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	89		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	89		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	107		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	23		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	23		
	Grating				
	Supply and fix 38mm thick heavy duty moulded FRP grating with anti-slip grit surface, mesh size 38mm x 38mm, complete with stainless steel saddle clips and all necessary accessories, fixed to concrete all in accordance with the Architect's details and specifications.				
F	Trench grating	sm	15		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page PH/ 1				
	From Page PH / 2				
	From Page PH/ 3				
	From Page PH / 4				
	From Page PH / 5				
	From Page PH / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Columns	cm	2		
B	Ring beam and lintel	cm	7		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
C	Assorted bars	Kg	1080		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Sides of columns	sm	25		
E	Sides and soffits of ring beam	sm	75		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	70		
B	200mm thick gable walls	sm	14		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm wide	m	34		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
D	200mm thick walls	sm	30		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
E	200mm thick walls	m	12		
	Concrete Vents				
F	300mm x 300mm precast concrete vents blocks laid and jointed with cement and sand mortar; painted to detail; all to Architect's details and specifications	sm	16		
	Coping				
G	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	14		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING **(ALL PROVISIONAL)** **Roof Covering** **24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details**				
A	Roof covering ***The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes***	sm	116		
B	200mm x 50mm purlins	m	75		
C	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	30		
D	100mm x 50mm common rafters	m	178		
E	200mm x 50mm ridge board	m	15		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Timber Trusses				
	The following in 10 No. trusses				
A	150mm x 50mm principal rafters	m	77		
B	100mm x 50mm struts and ties	m	96		
C	150mm x 50mm tie beam	m	58		
	UPVC rainwater goods				
D	125mm x 150mm box gutter fixed with manufacturer's approved brackets at 600mm centres	m	31		
	Extra over rainwater goods for :-				
E	100mm diameter outlet	No	4		
F	Stopped end	No	4		
	Wrot celcured prime grade cypress				
G	250mm x 38mm fascia board and verge boards	m	31		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
H	Surfaces between 200mm and 300mm girth	m	31		
	Carried to Collection				
	COLLECTION				
	From Page PH / 10				
	From Page PH/ 11 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; DOORS				
	Steel-Doors				
A	3000mm x 2400mm pressed solid steel louver double door complete with; 100mm x 50mm x 3mm RHS top and middle rail; 100mm x 50mm x 3mm RHS bottom rail; 18 gauge mild steel louvres with 20mm overlap; 100mm x 50mm x 3mm R.H.S sub frame; hinges, stays, fasteners, assembled and fixed to opening including cutting and pinning lugs; complete with purpose made latch lock; 300mm long pull handles; and any other ironmongery item; to Architect's pattern, detail and specification (D04)	No.	2		
B	Ditto; 2400mm x 2400mm (D05)	No.	1		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
C	Rubber door stopper	No	3		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
D	Doors; both sides measured	sm	41		
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	20mm thick screed to receive terrazzo	sm	81		
B	20mm thick: to ramps	sm	12		
	Terrazzo				
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
D	To ramps	sm	12		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
F	Walls	sm	144		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
G	Walls	sm	144		
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
H	Walls and concrete surfaces	sm	84		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
J	Externally to walls and concrete surfaces	sm	84		
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	POWERHOUSE				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		PH / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		PH /8		
	3. WALLING		PH / 9		
	4. ROOF		PH / 11		
	5. DOORS		PH / 12		
	6. FINISHES		PH /13		
	TOTAL POWERHOUSE CARRIED TO MAIN SUMMARY				

REFUSE ROOM

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	24		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	49		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	49		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	74		
L	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	6		
M	Extra over excavation in different classes of rock	cm	16		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	64		
D	Remove surplus soil and dispose as directed	cm	16		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	18		
F	Ditto to column bases	sm	4		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	Strip footing	cm	5		
H	Column bases	cm	3		
J	Columns	cm	1		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
K	150mm thick solid ground floor slab	sm	44		
L	150mm ramp	sm	4		
	Mesh fabric reinforcement				
M	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	44		
N	Ditto; to ramps	sm	4		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
A	Assorted bars	Kg	960		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Sides of strip footing	sm	15		
C	Soffits of ramp	sm	4		
D	Sides of column starters	sm	8		
E	Sides of column bases	sm	6		
F	Sides and soffits of ground beam	sm	26		
G	Edges: ground floor slab 75mm - 150mm girth	m	28		
	Foundation Walling				
H	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm^2	sm	51		
	Imported Fill				
J	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	36		
K	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	54		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Blinding				
A	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	36		
	Anti-termite treatment				
B	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	36		
	DPM				
C	Gauge 1000 polythene damp proof membrane	sm	44		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
D	Plinths: externally	sm	13		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
E	Plinths: externally	sm	13		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page RR/ 1				
	From Page RR / 2				
	From Page RR/ 3				
	From Page RR / 4				
	From Page RR / 5				
	From Page RR / 6				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 30N/mm² at 28 days; in				
A	Ring beam and lintel	cm	3		
B	Columns	cm	1		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
C	Assorted bars	Kg	480		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
D	Sides of columns	sm	13		
E	Sides and soffits of ring beam	sm	33		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	53		
B	200mm thick gable walls	sm	14		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm wide	m	21		
	Concrete Vents				
D	300mm x 300mm precast concrete vents blocks laid and jointed with cement and sand mortar; painted to detail; all to Architect's details and specifications	sm	6		
	Coping				
E	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	14		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING **(ALL PROVISIONAL)** **Roof Covering** **24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details**				
A	Roof covering ***The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes***	sm	49		
B	200mm x 50mm purlins	m	31		
C	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	12		
D	100mm x 50mm common rafters	m	70		
E	200mm x 50mm ridge board	m	6		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Timber Trusses				
	The following in 4 No. trusses				
A	150mm x 50mm principal rafters	m	31		
B	100mm x 50mm struts and ties	m	39		
C	150mm x 50mm tie beam	m	24		
	UPVC rainwater goods				
D	125mm x 150mm box gutter fixed with manufacturer's approved brackets at 600mm centres	m	12		
	Extra over rainwater goods for :-				
E	100mm diameter outlet	No	4		
F	Stopped end	No	4		
	Wrot celcured prime grade cypress				
G	250mm x 38mm fascia board and verge boards	m	12		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
H	Surfaces between 200mm and 300mm girth	m	12		
	Carried to Collection				
	COLLECTION				
	From Page RR / 10				
	From Page RR/ 11 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; DOORS				
	Steel-Doors				
A	3000mm x 2400mm pressed solid steel louver double door complete with; 100mm x 50mm x 3mm RHS top and middle rail; 100mm x 50mm x 3mm RHS bottom rail; 18 gauge mild steel louvres with 20mm overlap; 100mm x 50mm x 3mm R.H.S sub frame; hinges, stays, fasteners, assembled and fixed to opening including cutting and pinning lugs; complete with purpose made latch lock; 300mm long pull handles; and any other ironmongery item; to Architect's pattern, detail and specification (D04)	No.	1		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
B	Rubber door stopper	No	1		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
C	Doors; both sides measured	sm	15		
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	20mm thick screed to receive terrazzo	sm	33		
B	20mm thick: to ramps	sm	4		
	Terrazzo				
	Insitu 20mm thick terrazzo including divised strip and polished smooth laid on prepared screed (m/s)				
C	Ramps	sm	4		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	67		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
E	Walls	sm	67		
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
F	Walls and concrete surfaces	sm	67		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
G	Externally to walls and concrete surfaces	sm	67		
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	REFUSE ROOM				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		RR / 7		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		RR /8		
	3. WALLING		RR / 9		
	4. ROOF		RR / 11		
	5. DOORS		RR / 12		
	6. FINISHES		RR /13		
	TOTAL REFUSE ROOM CARRIED TO MAIN SUMMARY				

GATE HOUSE

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional) **Pricing Notes:** **(i) Site Visit** **The Tenderer is advised to visit the site before pricing and ascertain the nature of any existing buildings, terrain, services and site constraints. NO claims arising from the tenderers ignorance will be entertained. Allow for protection of existing services and structures.** **(ii) Bulk Excavation** **Site clearance of bush, vegetation, mass excavation has been executed by others under Bulk Excavation Work-Package. However, part of the bulk excavation has been left intact and to be undertaken within this scope as measured here under.** **(iii) Rock level and types shall be agreed with consultants prior to commencement of respective excavations** **Classes of Rock** **(a) Class I:** **Softrock of the type known locally as "tuff" or "magadi" which in the opinion of the Structural Engineer cannot be considered as hardrock shall be known as ClassI rock. Murram and Kunker is specifically excluded and will be reckoned as common excavation.** **(b) Class II:** **Very weathered black trap or lava containing many fissures and faults shall be known as ClassII rock. This type of rock contains stones and boulders of unweathered or incompletely weathered black trap or lava. A boulder or out crop of harder rock 13.5 cu.metre or less, and first quality blue, grey or green building stone in a formation which is massive and geologically homogeneous, will be deemed to be Class II rock.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	(c) Class III: **Black trap in a formation which is massive and geologically homogeneous shall be known as ClassIII rock. The opinion of the Structural Engineer in classifying rock shall be final and binding. Common excavation shall mean excavation in any material which are not solid rock as defined in this Clause.** **(iv) Blasting** **No blasting will be allowed without the written permission of the Engineer. Should blasting be necessary, the Contractor shall take every precaution to protect the Works and persons, animals and property in the vicinity of the Works.** **The Contractor will be held responsible for any injury or damage caused by any blasting operations and shall make good such damage at his own expense. Tenderers are advised to price the tender in conjunction with the notes made on the engineer's drawings. Fill material shall be deposited in layers of approved thickness, with each layer compacted to required densities: all as prescribed and approved by the engineer. Cutting down trees shall be deemed to include obtaining necessary permits from the relevant authorities. Disposal of such trees, stumps and roots shall be in accordance with the requirements of such authorities.** **The contractor shall ensure that the trucks are not over-filled with loose materials and all roads shall be kept clean by regular sweeping. NOTE: Contractor's are reminded to visit the site and ascertain the scope and other site conditions likely to affect their pricing.**				
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Carefully cutdown existing hedges and grub-up their roots; average height 600mm; cartaway debris and all arising	m	38		
B	Cut down trees and grub up stumps and roots; Girth exceeding 600mm but not exceeding 900mm; cartaway debris and all arising	No.	1		
C	Cut down trees and grub up stumps and roots; Girth exceeding 900mm but not exceeding 1200mm; cartaway debris and all arising	No.	1		
D	Cut down trees and grub up stumps and roots;Girth exceeding 1200mm but not exceeding 1500mm; cartaway debris and all arising	No.	1		
E	Cut down trees and grub up stumps and roots; Girth exceeding 1500mm but not exceeding 1800mm; cartaway debris and all arising	No.	1		
F	Carefully grub up existing stumps and roots; Girth exceeding 1800mm but not exceeding 2100mm; cartaway debris and all arising	No.	1		
G	Cut down trees and grub up stumps and roots; Girth exceeding 2400mm but not exceeding 2700mm; cartaway debris and all arising	No.	1		
H	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	21		
J	Top soil excavation; average 150mm thick depth to reduced levels	sm	21		
	Earthworks, Excavations and Fillings				
K	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	32		
L	Excavate for strip foundation commencing from the reduced level not exceeding 1.5m deep	cm	4		
M	Extra over excavation in different classes of rock	cm	18		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
A	Allow for upholding and supporting sides of excavations including any necessary plunking and strutting	Item			
B	Allow for keep excavations free of water including any necessary pumping	Item			
C	Return, fill and ram selected soil in foundations	cm	26		
D	Remove surplus soil and dispose as directed	cm	10		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	11		
	Vibrated reinforced insitu concrete class 25/30; mixed with hydophobic impregnation additive & crystalysing hydrophobic impregnation to structural Eng. Specification; with minimum cube crushing strength of 25N/mm² at 28 days; in				
F	Strip footing	cm	3		
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
G	150mm thick solid ground floor slab	sm	16		
	Mesh fabric reinforcement				
H	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	16		
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
J	Assorted bars	Kg	360		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
A	Sides of strip footing	sm	10		
B	Edges: ground floor slab 75mm - 150mm girth	m	16		
	Foundation Walling				
C	200mm thick chisel dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 10N/mm²	sm	30		
	Imported Fill				
D	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	13		
E	Approved imported murram filling to make up levels compacted in layers not exceeding 150mm thick, compacted to 98% MDD	cm	20		
	Blinding				
F	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	13		
	Anti-termite treatment				
G	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	13		
	DPM				
H	Gauge 1000 polythene damp proof membrane	sm	16		
	25mm thick cement and sand (1:4) rendering: on concrete or stonework: wood float: to				
J	Plinths: externally	sm	8		
	Prepare surfaces and apply undercoat and two finishing coats black bitumastic or other equal approved water resistant paint: on rendered surfaces: to				
K	Plinths: externally	sm	8		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page GH/ 1				
	From Page GH / 2				
	From Page GH/ 3				
	From Page GH / 4				
	From Page GH / 5				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: REINFORCED CONCRETE SUPERSTRUCTURE				
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	Ring beam and lintel	cm	2		
	Reinforcement				
	Supply and fix high yield deformed ribbed bars to BS 4449/1997; Grade 460B high yield strength Type 2; Proof stress of 500N/mm^2, in structural concrete work including cutting, bending, hoisting, tying wire, spacing tods and support all positions				
B	Assorted bars	Kg	240		
	Formwork				
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
C	Sides and soffits of ring beam	sm	17		
	REINFORCED CONCRETE SUPERSTRUCTURE WORKS CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 3: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	29		
B	200mm thick gable walls	sm	9		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
C	200mm wide	m	15		
	Internal Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
D	100mm thick walls	sm	8		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
E	200mm wide	m	3		
	Coping				
F	300mm wide x 50mm thick precast concrete weathered and throated to wall	m	9		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4: ROOFING **(ALL PROVISIONAL)** **Roof Covering** **24 Gauge concealed interlocking roof sheeting fixed to internal steel purlins (m.s) using approved clips screw fixed to the purlins with approved wafer head self tapping screws. The sheeting will be a double interlocking concealed fix profil, roll formed in continuous length from centified steel or aluminium. The profile shall be roll formed with four ribs and centres not exceeding 233mm and a cover width not exceeding 700mm including all necessary curvatures, hoisting, placing and connections to strctural Engineer details**				
A	Roof covering **Under-roof sisalation**	sm	21		
B	Supply and fix 5mm thick heavy duty, self extinguishing, double sided reflective foil roof insulation with a closed cell polyethelene foam core that provides a radiant barrier, thermal insulation and a moisture barrier, laid to roof structure (m.s) to receive roof covering (m.s) to manufacturer's specification to; ***The following in sawn celcured 2nd grade cypress with and including all necessary nailing/bolting, drilling holes***	sm	21		
C	200mm x 50mm purlins	m	24		
D	100mm x 50mm wall plate fixed with and including hoop iron fixed to ringbeam	m	8		
E	100mm x 50mm common rafters	m	45		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	UPVC rainwater goods				
A	125mm x 150mm box gutter fixed with manufacturer's approved brackets at 600mm centres	m	8		
	Extra over rainwater goods for :-				
B	100mm diameter outlet	No	2		
C	Stopped end	No	4		
	Wrot celcured cypress				
D	100mm x 25mm T & G eaves boarding fixed to bearers	sm	5		
E	50mm x 50mm runners	m	8		
F	50mm x 50mm bearers	m	9		
	Wrot celcured prime grade cypress				
G	250mm x 38mm fascia board and verge boards	m	8		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
H	General surfaces of eaves	sm	5		
J	Surfaces between 200mm and 300mm girth	m	8		
	Carried to Collection				
	COLLECTION				
	From Page GH / 9				
	From Page GH/ 10 (above)				
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; WINDOWS				
	Approved concrete cill; twice throated, twice weathered: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement				
A	250mm x 100mm thick cill	m	5		
	12mm thick one coat bed; wood floated to receive precast window cills (m/s); to concrete or block work base; generally to				
B	Window cills; 200mm to 300mm wide	m	5		
	Wrot mahogany: prime grade, selected				
C	200mm x 20mm thick window board	m	5		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
D	Over 100mm but not exceeding 200mm girth: window board	m	5		
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
E	Surfaces over 100mm but not exceeding 200mm girth: window board	m	5		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Steel Windows				
	Supply and fix the following purpose made mild steel casement windows; with 50mm x 50mm with 50mm thick "Z" section framing, for both openable and fixed panels and 16mm thick solid bar burglar proofing to the inside behind the 25mm T - sections maximum spacing for both 250 - 350mm horizontal and 250 - 350mm vertically including all coupling mullions etc; and complete with bronze handles, peg stays and other ironmongery; factory primed with red oxide primer including cutting and pining fixing lugs to concrete or masonry work jambs; bedding in cement and sand (1:3) mortar, pointing all round frames in mastic, easing, oiling and adjusting opening lights on completion				
A	900mm width x 600mm overall size	No	1		
B	900mm width x 1500mm overall size	No	2		
C	1000mm width x 1500mm overall size	No	2		
	Glazing				
	6mm thick glass and glazing to casements with linseed putty				
D	Windows; pane size to Architect's details	sm	6		
	6mm thick obscured glass and glazing to casements with linseed putty				
E	Windows to washroom areas; pane size to Architect's details	sm	1		
	Prepare surfaces and apply three coats of approved paint to mild steel metal surfaces; spray painted to approval				
F	Windows; both sides measured	sm	13		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	COLLECTION				
	From Page GH / 11				
	From Page GH/ 12 (above)				
	WINDOWS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 6; DOORS				
	Timber doors				
A	Supply and fix 50mm thick hollow core flush door; overall size 900mm x 2400 mm high; composed of 5 mm plywood facing both sides over a kraft paper honeycomb core; including hardwood lipping to edges; to Architect's door schedule (D2)	No	1		
	Solid Timber Doors				
B	50mm thick sibgle leaf solid panelled mvule door comprising of 200 x 50mm thick polished mahogany top and bottom rails, 150 x 50mm thick polished mahogany intermediate rails and hinge stile overall size 900mm x 2400mm high; to Architect's door schedule (D1)	No	1		
	Wrot cypress: prime grade; selected				
C	200mm x 50mm thick door frames	m	6		
D	Ditto transomes	m	6		
E	50mm x 75mm Architrave: splayed	m	6		
F	12mm diameter hardwood quodrant	m	6		
G	225mm x 50mm thick rebated polished mvule door frames	m	6		
H	Ditto transomes	m	6		
J	75mm x 25mm Architrave: splayed	m	6		
K	12mm diameter hardwood quodrant	m	6		
	Prepare and apply one coat of approved wood primer on timber surfaces in contact with concrete or masonry surfaces				
L	Over 100mm but not exceeding 200mm girth	m	12		
M	Not exceeding 100mm girth	m	12		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare surfaces: apply three coats of approved varnish on wood: to surfaces				
A	Over 100mm but not exceeding 200mm girth	m	24		
B	Not exceeding 100mm girth	m	24		
C	General timber surfaces: doors	sm	8		
	Supply and fix approved ironmongery; matching screws, locks complete with set of keys; with parts and complete replacement available from authorized local dealers; finish to Architect's door schedule and approval				
D	Pairs of 100mm stainless steel polished butt hinges and stainless screws	Prs	3		
E	Three lever mortice locks with furniture	No	2		
F	Polished stainless steel door handles	No	4		
G	Rubber door stopper	No	2		
H	2mm thick satin stainless steel kick plate screwed to door surfaces	No	4		
J	2mm thick satin stainless steel push plate screwed to door surfaces	No	2		
K	Aluminium coat hanger	No	2		
	Carried to Collection				
	COLLECTION From Page GH / 14 From Page GH/ 15 (Above)				
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 7; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed to receive ceramic tiles	sm	13		
	Ceramic Tiles				
	Supply and fix approved ceramic tiles; non-slip floor tiles; to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
B	400mm x 400mm x 8mm thick tiles	sm	13		
C	150mm high skirting	m	20		
	WALL FINISHES:				
	Internal wall finishes				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Walls	sm	54		
	Backing: 10mm cement/sand (1:4): on masonry or concrete: wood float finished: to				
E	Walls to receive ceramic tiles (m.s.)	sm	21		
	Supply and fix approved ceramic wall tiles to regular pattern; bedding and jointing in cement mortar (1:4); grouting joints with matching cement.				
F	400mm x 400mm x 8mm thick tiles	sm	21		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
A	Walls	sm	54		
	EXTERNAL WALL FINISHES				
	External cement and sand (1:3) render: steel trowelled: on masonry or concrete: to				
B	Walls and concrete surfaces	sm	38		
	Prepare surfaces: apply weather proof textured cement based paint on wall and column surfaces: on rendered wall as per manufacturer's specifications				
C	Externally to walls and concrete surfaces	sm	38		
	CEILING & BEAM FINISHES				
	Plaster: 12mm cement/lime putty/sand: steel trowelled: on masonry or concrete: to				
D	Sides and soffits of beams	sm	17		
	Wrot celcured cypress				
E	25mm Tongue and Groove (T&G) boarding fixed to and including brandering	sm	9		
F	75mm coved cornice	m	12		
	Prepare wall and apply internal paints as per Architects requirement and approval; two coats of approved undercoat; one coat of skimming between the undercoats; and two final coats of approved paint all as per Architect's instruction				
G	Beams	sm	17		
	Prepare surfaces: apply three coats of approved varnish : on timber surfaces: to				
H	Softboard ceiling internally	sm	9		
J	Surfaces 0 - 100mm girth; cornice	m	12		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	600mm x 600mm laid in grid suspended semi recessed sound reflective acoustic panels in approved grid system fixed with metal suspended hangers as specified by manufacturers complete with white perimeter trims and wall angles as necessary				
A	Ceiling: patterns to Architect's approval and detail	sm	5		
	Carried to Collection				
	COLLECTION From Page GH / 16 From Page GH/ 17 From Page GH/ 18 (above)				
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	GATE HOUSE				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		GH / 6		
	2. REINFORCED CONCRETE SUPERSTRUCTURE		GH /7		
	3. WALLING		GH / 8		
	4. ROOF		GH / 10		
	5. WINDOWS		GH / 13		
	5. DOORS		GH / 15		
	6. FINISHES		GH / 18		
	TOTAL GATE HOUSE CARRIED TO MAIN SUMMARY				

GAS CAGE

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 1; SUBSTRUCTURES (All Provisional)				
A	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	17		
B	Top soil excavation; average 150mm thick depth to reduced levels	sm	17		
	Earthworks, Excavations and Fillings				
C	Mass excavation on plinth area, not exceeding 1.5metres from reduced levels and cart away to a place approved by local authority	cm	32		
D	Remove surplus soil and dispose as directed	cm	32		
	Mass concrete class 15/20: in				
E	50mm thick blinding under strip footing	sm	17		
	Imported Fill				
F	300mm thick imported hardcore bed well compacted in layers not exceeding 150mm thick	sm	17		
	Blinding				
G	50mm thick approved quality quarry dust blinding to surfaces of hardcore	sm	17		
	Anti-termite treatment				
H	Approved anti-termite chemical treatment: applied by approved professional pest control specialist: applied strictly in accordance with the manufacturer's instructions: 10 year guarantee	sm	17		
	DPM				
J	Gauge 1000 polythene damp proof membrane	sm	17		
	Mesh fabric reinforcement				
K	Mesh reinforcement No. A142 size 200mm x 200mm weighing 2.24 kg per square metre: in floor slab: including all necessary supports	sm	17		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	Vibrated reinforced insitu concrete class 25/30; with minimum cube crushing strength of 25N/mm² at 28 days; in				
A	150mm thick solid ground floor slab	sm	17		
	Formwork: Marine ply boards reinforced with timber or steel frames to:-				
B	Edges: ground floor slab 75mm - 150mm girth	m	16		
	Carried to Collection				
	COLLECTION				
	From Page GC/ 1				
	From Page GC / 2				
	SUBSTRUCTURES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT No. 2: WALLING				
	External Walls				
	Machine dressed natural stone walling bedded in cement and sand mortar (1:3) with minimum stone crushing strength of 7N/mm² and reinforced with hoop iron gauge 500 in every alternative course.				
A	200mm thick walls	sm	8		
	Bituminous hessian base to BS 743 type A: or other equal approved damp-proof course: in cement/ sand (1:3) mortar				
B	200mm wide	m	15		
	GAS CAGE				
	Supply, fabricate and install mild steel gas cage comprising 50mm x 50mm x 3mm thick horizontal members, 50mm x 50mm x 3mm thick and 25mm x 25mm x 3mm thick vertical members formed from approved mild steel sections arranged in the specified pattern; members securely welded, ground smooth and fixed to concrete/masonry structure with approved brackets, bolts or anchor plates; including all necessary cutting, drilling, hoisting and fixing in position; finished with one coat of red oxide primer and two coats of approved paint to Architect's approval; all complete as per drawings and specifications.				
C	Gas cage	sm	36		
	WALLING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 3: ROOFING				
	(ALL PROVISIONAL)				
	Roof Covering				
	Supply and fix standing seam pre-painted galvanised iron roofing sheets laid on steel purlins complete with all necessary fixing clips, fasteners, laps, flashings and accessories in accordance with the Engineer's details and specifications.				
A	Roof covering	sm	17		
	Unframed mild steel work as described complete with bolts, nuts, washers, splash plates and base plates; including drilling, hoisting and placing at roof level, one coat red oxide primer before fixing and touch up on completion to approval				
B	25 x 25 x 3mm RHS purlins x (2.07kg/m)	Kgs	55		
C	50 x 50 x 3mm RHS Rafters x (4.24kg/m)	Kgs	81		
	ROOFING CARRIED TO FLOOR SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 4; DOORS				
	Steel-Doors				
A	1000mm x 2000mm mild steel door complete with; 100mm x 50mm x 3mm RHS top and middle rail; 100mm x 50mm x 3mm RHS vertical rail; hinges, stays, fasteners, assembled and fixed to opening including cutting and pinning lugs; complete with purpose made latch lock; 300mm long pull handles; and any other ironmongery item; to Architect's pattern, detail and specification	No.	1		
	DOORS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	ELEMENT NO. 5; FINISHES				
	FLOOR FINISHES				
	Screed: cement and sand (1:3) on concrete: wood floated finished				
A	32mm thick screed	sm	16		
	WALL FINISHES:				
	Keying and Pointing				
F	Form keyed and pointed finish to exposed masonry walling, including striking and finishing joints in cement and sand mortar and brushing the wall face to produce a uniform textured keyed appearance	sm	16		
	FINISHES CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	GAS CAGE				
	SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. SUBSTRUCTURE		GC / 2		
	2. WALLING		GC/ 3		
	3. ROOF		GC/ 4		
	4. DOORS		GC/ 5		
	5. FINISHES		GC/ 6		
	TOTAL GAS CAGE CARRIED TO MAIN SUMMARY				

BUILDERS WORKS SUMMARY

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	BUILDERS WORKS SUMMARY				
	ELEMENT NO.		**PAGE NO.**		
	1. ADMINISTRATION BUILDING		ADM/ 26		
	2. TEACHING BUILDING		TBS / 1		
	3. AQUA CENTRE		ACQ / 31		
	4.VISITOR'S CENTER AND MUSEUM		VCM / 25		
	5.RESTAURANT		RST / 27		
	6. WORKSHOP 1		WKS1 / 21		
	7. WORKSHOP 2		WKS2 / 21		
	8. POWER HOUSE		PH / 14		
	9. REFUSE ROOM		RR / 14		
	10. GATE HOUSE		GH / 19		
	11. GASE CAGE		GC / 7		
	TOTAL BUILDERS WORKS CARRIED TO GRAND SUMMARY				

EXTERNAL WORKS

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	ELEMENT N0 01; ROADS, PARKING AND DRIVEWAYS				
	Site preparation				
A	Clear site of all vegetation including small and large trees, scrubs and bushes, excavate to remove top vegetable soil and heap as directed on site; average depth of 250mm	sm	4647		
	Excavation				
B	Mass excavation to reduce levels: not exceeding 1.5m deep from stripped level	cm	2324		
	Disposal of Excavated material				
C	Load and cart away surplus excavated material from site to approved dumping sites.	cm	2324		
	Treatment of Surfaces				
D	Grade and compact subgrade to 2.5% falls:bottoms of excavations: compact to 100% B.S compaction to receive road paving works; to engineer's approval	sm	4647		
	Fillings				
E	Murram: graded to falls and cross falls: compacted to 100% B.S standard compaction	cm	1394		
F	300mm Thick hand-packed stone: graded to falls and cross falls: compacted to 100% B.S standard compaction	sm	4647		
G	50mm Quarry stone dust filling: ditto: finished to receive cabro blocks (measured separately)	sm	4647		
	Precast concrete units: Mix 1:2:4 (12 mm aggregate): vibrated				
H	600mm x 600mm x 50mm thick paving slabs: smooth finished: pointed and jointed in cement and sand (1:4) mortice bedded on and including 50m thick compacted sand bed	sm	3577		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	Precast concrete units: Mix 1:2:4 (12 mm aggregate): vibrated				
A	125mm x 250mm Kerb: half battered: bedded jointed and pointed in cement and sand (1:3) mortar:125 x 100 mm channel laid on and including 300 x 100 mm concrete class 15/20 foundation: 100x200 mm haunching excavation formwork	m	212		
B	Ditto: Curved to radius	m	30		
	Approved concrete paving blocks: on sand or quarry stone chippings (measured separately)				
C	80mm heavy duty pre-cast concrete paving blocks with minimum strength of 50N/mm^2 laid to slope on quarry dust and compacted	sm	1078		
	Markings and signs				
D	Prepare and apply approved road paint to all carpark marking and signs including paved areas; 100 mm wide in girth; colour to approval	m	115		
	Carried to Collection				
	COLLECTION From Page EW / 1 From Page EW / 2 (above)				
	PARKING & PAVED AREAS: CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	ELEMENT NO. 2; FOUL WATER DRAINAGE				
	WATER DRAINAGE				
	Excavation of trenches including maintaining sides and keeping bottoms free from water, mud and fallen materials, grading bottoms, backfilling and carting away surplus excavated material				
A	150mm Upvc drain pipe average depth 600 mm	m	391		
	Mass concrete class 15/20: in				
B	Concrete haunching	cm	59		
	Terrain UPVC class D buried drains:golden brown, medium duty: solvent cement welded joints:				
C	150mm diameter pipe: laid in trench	m	142		
D	Ditto; 100mm diameter	m	249		
	Extra Over uPVC Soil Pipework for the following:				
E	100mm DN uPVC tee	No.	46		
	600mm x 450mm internal dimensions masonry manholes all in accordance with the contract drawings; include for class 20 concrete bases and covers slab, step irons and heavy duty mild steel manhole cover and frame				
F	Depth not exceeding 1.5 metres	No	31		
	1050mm internal diameter class 20 concrete manholes all in accordance with the contract drawings; include for class 20 concrete bases and covers slab, step irons and heavy duty mild steel manhole cover and frame				
G	Depth exceeding 1.5metres n.e 3.0metres	No	13		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	Connection to existing sewerline				
A	Allow for connection to existing sewer line	Item	1		
	Testing and commisioning				
B	Allow for testing of the whole foul drainage installation to the satisfaction of the engineer and the local authority represantative and making good	Item	1		
	Carried to Collection				
	COLLECTION				
	From Page EW / 3				
	From Page EW / 4 (above)				
	TOTAL FOR STORM AND FOUL WATER DRAINAGE				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	ELEMENT NO. 3;WILD FISH POND				
A	Clear site of all vegetation including small trees, scrubs and bushes, grub up their roots and burn the arrisings	sm	170		
B	Top soil excavation; average 150mm thick depth to reduced levels	sm	170		
C	Excavate for wild fish pond commencing from existing ground level: not exceeding 1.5 m deep	cm	225		
D	Remove surplus soil from site to a place approved by local authority	cm	225		
	Dam Liner				
	Supply, deliver, lay and fix approved HDPE geomembrane dam liner, as specified, to base and sides of fish pond, laid on well-prepared smooth subgrade, including overlaps, thermal welding of joints, testing of seams, sealing around pipe penetrations, protection against puncture, and all necessary accessories complete in accordance with the Engineer's and Manufacturer's instructions.				
E	To base and sides of walls	sm	339		
	TOTAL FOR WILD FISH POND WORKS CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	EXTERNAL WORKS SUMMARY				
	ELEMENT No.		**PAGE No.**		
	1. ROADS, PARKING AND DRIVEWAYS		EW / 2		
	2. FOUL AND STORM WATER DRAINAGE		EW/ 4		
	3. WILD FISH POND		EW/ 5		
	TOTAL EXTERNAL WORKS CARRIED TO MAIN SUMMARY				

R621/01M

PROPOSED BLUE SKILLS TRAINING FOR EMPLOYMENT CENTRE (BSTEC) FOR THE KISUMU NATIONAL POLYTECHNIC ON KISUMU MUNICIPALITY / BLOCK 9 / 101

SPECIFICATIONS AND BILLS OF QUANTITIES – MECHANICAL WORKS VOLUME 1

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SECTION A

GENERAL MECHANICAL SPECIFICATIONS

SECTION A

GENERAL MECHANICAL SPECIFICATION

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QUALITY OF MATERIALS		A-1
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SECTION A

GENERAL MECHANICAL SPECIFICATION

2.01 General

This section specifies the general requirement for plant, equipment and materials forming part of the Sub-contract Works and shall apply except where specifically stated elsewhere in the Specification or on the Contract Drawings.

2.02 Quality of Materials

All plant, equipment and materials supplied as part of the Sub-contract Works shall be new and of first class commercial quality, shall be free from defects and imperfections and where indicated shall be of grades and classifications designated herein.

All products or materials not manufactured by the Sub-contractor shall be products of reputable manufacturers and so far as the provisions of the Specification is concerned shall be as if they had been manufactured by the Sub-contractor.

Materials and apparatus required for the complete installation as called for by the Specification and Contract Drawings shall be supplied by the Sub-contractor unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connection by the Sub-contractor shall be carefully examined on receipt. Should any defects be noted, the Sub-contractor shall immediately notify the Engineer.

Defective equipment or that damaged in the course of installation or tests shall be replaced as required to the approval of the Engineer.

2.03 Regulations and Standards

The Sub-contract Works shall comply with the current editions of the following:

a) The Kenya Government Regulations.

b) The United Kingdom Institution of Electrical Engineers (IEE) Regulations for the Electrical Equipment of Buildings.

The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guides.

d) British Standard and Codes of Practice as published by the British Standards Institution (BSI)

e) The Local Council By-laws.

f) The Electricity Supply Authority By-laws.

g) Local Authority By-laws.

h) The Kenya Building Code Regulations.

i) The Kenya Bureau of Standards

2.04 **Electrical Requirements**

Plant and equipment supplied under this Sub-contract shall be complete with all necessary motor starters, control boards, and other control apparatus. Where control panels incorporating several starters are supplied they shall be complete with a main isolator.

The supply power up to and including local isolators shall be provided and installed by the Electrical Sub-contractor. All other wiring and connections to equipment shall form part of this Sub-contract and be the responsibility of the Sub-contractor.

The Sub-contractor shall supply three copies of all schematic, cabling and wiring diagrams for the Engineer's approval.

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting currents described in the Kenya Power and Lighting Company (KPLC) By-laws.

All electrical plant and equipment supplied by the Sub-contractor shall be rated for the supply voltage and frequency obtained in Kenya, that is 415 Volts, 50Hz, 3-Phase or 240Volts, 50Hz, 1-phase.

Any equipment that is not rated for the above voltages and frequencies shall be rejected by the Engineer.

2.05 **Transport and Storage**

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimize the possibility of damage and to prevent corrosion or other deterioration.

On arrival at site all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

Adequate measures shall be taken by the Sub-contractor to ensure that plant and equipment do not suffer any deterioration during storage.

Prior to installation all piping and equipment shall be thoroughly cleaned.

If, in the opinion of the Engineer any equipment has deteriorated or been damaged to such an extent that it is not suitable for installation, the Sub-contractor shall replace this equipment at his own cost.

2.06 **Site Supervision**

The Sub-contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

2.07 **Installation**

Installation of all special plant and equipment shall be carried out by the Sub-contractor under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 2.03 of this Section.

2.08 **Testing**

2.08.1 General

The Sub-contractor's attention is drawn to Part 'C' Clause 1.38 of the "Preliminaries and General Conditions".

2.08.2 Material Tests

All material for plant and equipment to be installed under this Sub-contract shall be tested, unless otherwise directed, in accordance with the relevant B.S Specification concerned.

For materials where no B.S. Specification exists, tests are to be made in accordance with the best modern commercial methods to the approval of the Engineer, having regard to the particular type of the materials concerned.

The Sub-contractor shall prepare specimens and performance tests and analyses to demonstrate conformance of the various materials with the applicable standards.

If stock material, which has not been specially manufactured for the plant and equipment specified is used, then the Sub-contractor shall submit satisfactory evidence to the Engineer that such materials conform to the requirements stated herein in which case tests of material may be partially or completely waived.

Certified mill test reports of plates, piping and other materials shall be deemed acceptable.

2.08.3 Manufactured Plant and Equipment – Work Tests

The rights of the Engineer relating to the inspection, examination and testing of plant and equipment during manufacture shall be applicable to the Insurance Companies or Inspection Authorities so nominated by the Engineer.

The Sub-contractor shall give two weeks' notice to the Engineer of the manufacturer's intention to carry out such tests and inspections.

The Engineer or his representative shall be entitled to witness such tests and inspections. The cost of such tests and inspections shall be borne by the Sub-contractor.

Six copies of all test and inspection certificates and performance graphs shall be submitted to the Engineer for his approval as soon as possible after the completion of such tests and inspections.

Plant and 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 and inspection certificates not be approved, new tests may be ordered by the Engineer at the Sub-contractor's expense.

2.08.4 Pressure Testing

All pipework installations shall be pressure tested in accordance with the requirements of the various sections of this Specification. The installations may be tested in sections to suit the progress of the works but all tests must be carried out before the work is buried or concealed behind building finishes. All tests must be witnessed by the Engineer or his representative and the Sub-contractor shall give 48 hours' notice to the Engineer of his intention to carry out such tests.

Any pipework that is buried or concealed before witnessed pressure tests have been carried out shall be exposed at the expense of the Sub-contractor and the specified tests shall then be applied.

The Sub-contractor shall prepare test certificates for signature by the Engineer and shall keep a progressive and up-to-date record of the section of the work that has been tested.

2.09 **Colour Coding**

Unless stated otherwise in the Particular Specification all pipework shall be colour coded in accordance with the latest edition of B.S 1710 and to the approval of the Engineer or Architect.

2.10 **Welding**

2.10.1 Preparation

Joints to be made by welding shall be accurately cut to size with edges sheared, flame cut or machined to suit the required type of joint. The prepared surface shall be free from all visible defects such as lamination, surface imperfection due to shearing or flame cutting operation, etc., and shall be free from rust scale, grease and other foreign matter.

2.10.2 Method

All welding shall be carried out by the electric arc processing using covered electrodes in accordance with B.S. 639.

Gas welding may be employed in certain circumstances provided that prior approval is obtained from the Engineer.

2.10.3 Welding Code and Construction

All welded joints shall be carried out in accordance with the following Specifications:

Pipe Welding

All pipe welds shall be carried out in accordance with the requirements of B.S.806.

General Welding

All welding of mild steel components other than pipework shall comply with the general requirements of B.S. 1856.

Welders Qualifications

Any welder employed on this Sub-contractor shall have passed the trade tests as laid down by the Government of Kenya.

The Engineer may require to see the appropriate to see the appropriate certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Engineer may instruct the Sub- contractor to replace him by a qualified welder.

SECTION B

PARTICULAR PLUMBING AND DRAINAGE

SPECIFICATIONS

SECTION B

PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

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3.1	General
3.2	Materials and standards
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3.2.2	Valves
3.2.3	Waste Fitment Traps
3.2.4	Pipe Supports
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3.3	Installation
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SECTION B
PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

3.1 GENERAL

This section specifies the general requirements for plant, equipment and materials forming part of the plumbing and drainage installations.

3.2 MATERIALS AND STANDARDS

3.2.1 Pipework and Fittings

Pipework materials are to be used as follows:

a) Galvanized Steel Pipework

Galvanized steel pipe work up to 65mm nominal bore shall be manufactured in accordance with B.S. 1387 Medium Grade, with tapered pipe threads in accordance with B.S. 21. All fittings shall be malleable iron and manufactured in accordance with B.S. 143.

Pipe joints shall be screwed and socketed and sufficient coupling unions shall be allowed so that fittings can be disconnected without cutting the pipe. Running nipples and long screws shall not be permitted unless exceptionally approved by the Engineer.

Galvanized steel pipe work, 80mm nominal bore up to 150mm nominal bore shall be manufactured to comply in all respects with the specification for 65mm pipe, except that screwed and bolted flanges shall replace unions and couplings for the jointing of pipes to valves and other items of plant. All flanges shall comply with the requirements of B.S. 10 to the relevant classifications contained hereinafter under Section 'C' of the Specification.

Galvanizing shall be carried out in accordance with the requirements of B.S. 1387 and B.S. 143 respectively.

b) Copper Tubing

All copper tubing shall be manufactured in accordance with B.S. 2871 from C.160 ' Phosphorous De-oxidized Non-Arsenical Copper' in accordance with B.S. 1172.

Pipe joints shall be made with soldered capillary fittings and connections to equipment shall be with compression fittings manufactured in accordance with B.S. 864.

Short copper connection tubes between galvanized pipe work and sanitary fitments shall not be used because of the risk of galvanic action.

If, as may occur in certain circumstances, it is not possible to make the connection in any way than the use of copper tubing, then a brass straight connector shall be positioned between the galvanized pipe and the copper tube in order to prevent direct contact.

P.V.C. (Hard) Pressure Pipes and Fittings

All P.V.C. pipes and fittings shall be manufactured in accordance with B.S. 3505: 1968.

Jointing

The method of jointing to be employed shall be that of solvent welding, using the pipe and manufacturer's approved cement. Seal ring joint shall be introduced where it is necessary to accommodate thermal expansion.

Testing

Pipelines shall be tested in sections under an internal water pressure normally one and a half times the maximum allowable working pressure of the class of pipe used. Testing shall be carried out as soon as practical after laying and when the pipeline is adequately anchored. Precautions shall be taken to eliminate all air from the test section and to fill the pipe slowly to avoid risk of damage due to surge.

A.B.S. Waste System

Where indicated on the Drawings and Schedules, the Sub-contractor shall supply and fix A.B.S. waste pipes and fittings.

The pipes, traps and fittings shall be in accordance with the relevant British Standards, including B.S. 3943, and fixed generally in accordance with manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipes shall be carried out by means of solvent welding, the manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipes shall be carried out by means of solvent welding. The manufacturer's recommended method of joint preparation and fixing shall be followed.

Standard brackets, as supplied for use with this system, shall be used wherever possible. Where the building structure renders this impracticable the Sub-contractor shall provide purpose made supports, centers of which shall not exceed one meter.

Expansion joints shall be provided as indicated. Supporting brackets and pipe clips shall be fixed on each side of these joints.

e) **PVC Soil System**

The Sub-contractor shall supply and fix PVC soil pipes and fittings as indicated on the Drawings and Schedules.

Pipes and fittings shall be in accordance with relevant British Standards, including B.S. 4514 and fixed to the manufacturer's instructions and B.S. 5572.

The soil system shall incorporate synthetic rubber gaskets as provided by the manufacturer whose fixing instructions shall be strictly adhere to.

Connections to WC pans shall be effected by the use of a WC connector, gasket and cover, fixed to suit pan outlet.

Suitable supporting brackets and pipe clips shall be provided at maximum of one metre centres.

The Sub-contractor shall be responsible for the joint into the Gully Trap on Drain as indicated on the Drawings.

3.2.2 **Valves**

a) Draw-off Taps and Stop Valves (Up to 50mm Nominal Bore)

Draw-off taps and valves up to 50mm nominal bore, unless otherwise stated or specified for attachment or connection to sanitary fitment shall be manufactured in accordance with the requirements of B.S.1010.

b) Gate Valves

All gate valves 80mm nominal bore and above, other than those required for fitting to buried water mains shall be of cast iron construction, in accordance with the requirements of B.S. 3464. All gate valves required for fitting to buried water mains shall be of cast iron construction in accordance with the requirements of B.S.1218.

All gate valves up to and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S. 1952.

The pressure classification of all valves shall depend upon the pressure conditions pertaining to the site of works.

c**) Globe Valves**

All globe valves up to and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S.3061.

The pressure classification of all globe valves shall depend upon the pressure conditions pertaining to the site of works.

3.2.3 **Waste Fitment Traps**

a) Standard and Deep Seal P & S Traps

Where standard or deep seal traps are specified they shall be manufactured in suitable non-ferrous materials in accordance with the full requirements of B.S. 1184.

In certain circumstances, cast iron traps may be required for cast iron baths and in these instances bath traps shall be provided which are manufactured in accordance with the full requirements of B.S.1291.

b) **Anti-Syphon Traps**

Where anti-syphon traps are specified, these shall be similar or equal to the range of traps manufactured by Greenwood and Hughes Limited, Deacon Works Little shampton, Sussex, England.

The tradename for traps manufactured by this company is 'Grevak'.

3.2.4 **Pipe Supports**

a) General

This sub-clause deals with pipe supports securing pipes to the structure of buildings for above ground application.

The variety and type of support shall be kept to a minimum and their design shall be such as to facilitate quick and secure fixings to metal, concrete, masonry or wood.

Consideration shall be given, when designing supports, to the maintenance of desired pipe falls and the restraining of pipe movements to a longitudinal axial direction only.

The Sub-contractor shall supply and install all steelwork forming part of the pipe support assemblies and shall be responsible for making good damage to builders work associated with
the pipe support installation.

The Sub-contractor shall submit all his proposals for pipe supports to the Engineer for approval before any erection works commence.

b) Steel and Copper Pipes and Tubes

Pipe runs shall be secured by clips connected to pipe angers, wall brackets, or trapeze type supports. 'U' bolts shall not be used as a substitute for pipe clips without the prior approval of the Engineer.

An approximate guide to the maximum permissible supports spacing in metres for steel and copper pipe and tube is given in the following table for horizontal runs.

Size Nominal Bores	**to B.S. 659**	**Copper Tube to B.S. 1387**	**Steel Tube**
15mm	1.25m	2.0m	
20mm	2.0m	2.5m	
25mm	2.0m	2.5m	
32mm	2.5m	3.0m	
40mm	2.5m	3.0m	
50mm	2.5m	3.0m	
65mm	3.0m	3.5m	
80mm	3.0m	3.5m	
100mm	3.0m	4.0m	
125mm	3.0m	4.5m	
150mm	3.5m	4.5m	

The support spacing for vertical runs shall not exceed one and a half times the distances given for horizontal runs.

c) **Expansion Joints and Anchors**

Where practicable, cold pipework systems shall be arranged with sufficient bends and changes of direction to absorb pipe expansion providing that the pipe stresses are contained within the working limits prescribed in the relevant B.S. specification.

Where piping anchors are supplied, they shall be fixed to the main structure only. Details of all anchor design proposals shall be submitted to the Engineer for approval before erection commences.

The Sub-contractor when arranging his piping shall ensure that no expansion movements are transmitted directly to connections and flanges on pumps or other items of plant.

The Sub-contractor shall supply flexible joints to prevent vibrations and other movements being transmitted from pumps to piping systems or vice versa.

3.2.5 **Sanitary Appliances**

All sanitary appliances supplied and installed as part of the Sub-contract works shall comply with the general requirements of B.S. Code of Practice 305 and the particular requirements of the latest B.S. Specifications.

3.2.6 **Pipe Sleeves**

Main runs of pipework are to be fitted with sleeves where they pass through walls and floors. Generally the sleeves shall be of P.V.C. except where they pass through the structure, where they shall be mild steel. The sleeves shall have 6mm – 12mm clearance all around the pipe or for insulated pipework all around the installation.
The sleeve will then be packed with slag wool or similar.

3.3 **INSTALLATION**

3.3.1 **General**

Installation of all pipework, valves, fittings and equipment shall be carried out under adequate supervision from skilled staff to the relevant codes and standards as specified herein. The Sub-contractor shall be responsible to the Main Contractor for ensuring
that all builders work associated with his piping installation is carried out in a
satisfactory manner to the approval of the Engineer.

3.3.2 **Above Ground Installation**

a) Water Services

Before any joint is made, the pipes shall be hung in their supports and adjusted to ensure that the joining faces are parallel and any falls which shall be required are achieved
without springing the pipe.

Where falls are not shown on the Contract Drawings or stated elsewhere in the Specification, pipework shall be installed parallel to the lines of the buildings and as
close to the walls, ceilings, columns, etc., as is practicable.

All water systems shall be provided with sufficient drain points and automatic air vents to enable them to function correctly.

Valves and other user equipment shall be installed with adequate access for operation and maintenance. Where valves and other operational equipment are unavoidably installed
beyond normal reach or in such position as to be difficult to reach from a small step ladder, extension spindles with floor or wall pedestals shall be provided.

Screwed piping shall be installed with sufficient number of unions to facilitate easy removal of valves and fittings, and to enable alterations of pipework to be carried out without the need to cut the pipe.

Full allowances shall be made for the expansion and contraction of pipework, precautions
being taken to ensure that any force produced by the pipe movements are not transmitted to valves, equipment or plant.
All screwed joints to piping and fittings shall be made with P.T.F.E. tape.
The test pressure shall be maintained by the pump for about one hour and if there is any leakage, it shall be measured by the quantity of water pumped into the main in that time. A general leakage of 4.5 litres per 25mm of diameter, per 1.6 kilometres per 24 hours per 30 metres head, may be considered reasonable but any visible individual leak shall be repaired.

b) Sanitary Services

Soil, waste and vent pipe system shall be installed in accordance with the best standard of modern practice as described in B.S. 5572 to the approval of the Engineer.

The Sub-contractor shall be responsible for ensuring that all ground waste fittings are discharged to a gully trap before passing to the sewer via a manhole.

The Sub-contractor shall provide all necessary rod ding and inspection facilities within the draining system in positions where easy accessibility is available.

Where a branch requires rodding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made rodding eye
in the nearest adjacent wall or floor to which easy access is available.

The vent stacks shall terminate above roof level and where stack passes through roof, a weather skirt shall be provided. The Sub-contractor shall be responsible for sealing the roof after installation of the stacks.

The open end of each stack shall be fitted with a plastic coated or galvanised steel wire guard.
Access for rodding and testing shall be provided at the foot of each stack.

Sanitary Appliances

All sanitary appliances associated with the Sub-contract works shall be installed in
accordance with the best standard of modern practice as described in C.P. 305 to the approval of the Engineer.

TESTING AND INSPECTION

3.4.1 **Site Tests – Pipework Systems**

a) Above Ground Internal Water Services Installation

All water service pipe system installed above ground shall be tested hydraulically for a period of one hour to not less than one and half times to design working pressure.

If preferred, the Sub-contractor may test the pipelines in sections. Any such section found to be satisfactory need not be the subject of a further test when system has been completed, unless specifically requested by the Engineer.
During the test, each branch and joint shall be examined carefully for leaks and any defects revealed shall be made good by the Sub-contractor and the section re-tested.

The Sub-contractor shall take all necessary precautions to prevent damage occurring to special valves and fittings during the tests. Any item damaged shall be repaired or replaced at the Sub-contractor's expenses.

b) Above Ground Soil Waste and Ventilation System

All soil, waste and ventilating pipe system forming part of the above ground installation, shall be given appropriate test procedures as described in B.S. 5572, 1972.

Smoke tests on above ground soil, waste and ventilating pipe system shall not be permitted.

Pressure tests shall be carried out before any work which is to be concealed is finally enclosed.

In all respects, tests shall comply with the requirements of B.S. 5572.

3.4.2 **Site Test – Performance**

Following satisfactory pressure test on the pipework system operational tests shall be carried out in accordance with the relevant B. S. Code of practice on the systems as a whole to establish that special valves, gauges, control, fittings, equipment and plant are functioning correctly to the satisfaction of the Engineer.

All hot water pipework shall be installed with pre-formed fibre glass lagging to a thickness of 25mm where the pipe runs above a false ceiling or in areas where the ambient temperature is higher than normal with the result that pipe "sweating", due to condensation will cause nuisance.

All lagged pipes which run in a visible position after erection shall be given a canvas cover and prepared for painting as follows:

i) Apply a coating of suitable filler until the canvas weave disappears and allow to dry.

ii) Apply two coats of an approved paint and finish in suitable gloss enamel to colors
iii) approved by the Engineer.

All lagging for cold and hot water pipes erected in crawlways, ducts and above false ceiling which after erection are not visible from the corridors of rooms, shall be covered with a reinforced aluminium foil finish banded in colours to be approved by the Engineer.

In all respects, unless otherwise stated, the hot and cold water installation shall be carried out in accordance with the best standard of modern practice and described in C.P.342 and C.P.310 respectively to the approval of the Engineer.

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains of large diameter, by a power driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded.

Pressure gauges should be recalibrated before the tests.

The Sub-contractor shall be deemed to have included in his price for all test pumps, and other equipment required under this specification.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. specification designates a maximum test pressure.

3.5 STERILISATION OF COLD WATER SYSTEM

All water distribution system shall be thoroughly sterilized and flushed out after the completion of all tests and before being fully commissioned for handover.

The sterilisation procedures shall be carried out by the Sub-contractor in accordance with the requirements of B.S. Code of Practice 301, Clause 409 and to the approval of the Engineer.

PART C

PARTICULAR SPECIFICATION

FOR

PORTABLE FIRE EXTINGUISHERS

PART C

PARTICULAR SPECIFICATION

FOR

PORTABLE FIRE EXTINGUISHERS

CLAUSE NO.	DESCRIPTION	PAGE
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4.3	Water/CO_2 Extinguishers	C-1
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PART C

PARTICULAR SPECIFICATIONS

FOR

PORTABLE FIRE EXTINGUISHER AND HOSE REEL INSTALLATIONS

4.1 GENERAL

The particular specification details the requirements for the supply and installation and commissioning of the Portable Fire Extinguishers and Boosted Hose Reel System. The Sub-contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the contract drawings but which are necessary for the completion and satisfactory functioning of the works.

If in the opinion of the Sub-contractor there is a difference between the requirements of the Specifications and the Contract Drawings, he shall clarify these differences with the Engineer before tendering.

4.2 SCOPE OF WORKS

The Sub-contractor shall supply, deliver, erect, test and commission all the portable fire extinguishers and Hose Reel which are called for in these Specifications and as shown on the Contract Drawings.

4.3 WATER/CO_2 EXTINGUISHERS

These shall be 9-litre water filled CO_2 cartridge operated portable fire extinguishers and shall comply with B.S. EN 3/BS 1449 and to the requirements of B.S.1004. Unless manufactured with stainless steel, bodies shall have all internal surfaces completely coated with either a lead tin, lead alloy or zinc applied by hot dipping. There shall be no visibly uncoated areas.

The extinguishers shall be clearly marked with the following:

Method of operation.

The words ‘WATER TYPE’ (GAS PRESSURE) in prominent letters.

Name and address of the manufacturer or responsible vendor.
The nominal charge of the liquid in imperial gallons and litres.

The liquid level to which the extinguisher is to be charged.

The year of manufacture.
A declaration to the effect that the extinguisher has been tested to a pressure of 24.1 bar (350 p.s.i.).

h) The number of British Standard 'B.S' 1004 or B.S. 1449.

4.4 PORTABLE CARBON DIOXIDE FIRE EXTINGUSHERS

These shall be portable carbon dioxide fire extinguishers and shall comply with B.S. EN 3/BS 1449 and B.S. 1004.

The body of extinguisher shall be a stainless steel cylinder manufactured to one of the following British Standards; B.S. 401 or B.S. 1288.

The filling ratio shall comply with B.S. 5355 with valves fittings for compressed gas cylinders to B.S.341. Where a hose is fitted it shall be flexible and have a minimum working pressure of 206.85 bar (3000 p.s.i.). The hose is not to be under internal pressure until the extinguisher is operated.

The nozzle shall be manufactured of brass gunmetal, aluminium or stainless steel and may be fitted with a suitable valve for temporarily stopping the discharge if such means are not incorporated in the operating head.

The discharge horn shall be designed and constructed so as to direct the discharge and limit the entrainment of air. It shall be constructed of electrically non-conductive material.
The following markings shall be applied to the extinguishers: -
The words "Carbon Dioxide Fire Extinguisher" and to include the appropriate nominal gas content.

Method of operation.
The words "Re-charge immediately after use".

Instructions for periodic checking.

The number of the British Standard B.S. 3326: 1960 or B.S. 5423.
The manufacturers name or identification markings

4.5 DRY CHEMICAL POWDER PORTABLE FIRE EXTINGUISHER

The portable dry powder fire extinguishers shall comply with BS EN 3/BS 1449 and BS 1004. The body shall be constructed to steel not less than the requirements of BS 1449
or aluminium to BS 1470 : 1972 and shall be suitably protected against corrosion.

The dry powder charge shall be not-toxic and retain it s free flowing properties under normal storage conditions. Any pressurizing agent used as an expellant shall be in dry state; in particular compressed air.

The discharge tube and gas tube if either is fitted shall be made of steel, brass, copper or other not less suitable material. Where a hose is provided it shall not exceed 1,060mm
and shall be acid and alkali resistant. Provision shall be made for securing the nozzle
when not in use.

The extinguisher shall be clearly marked with the following information

a) The word “Dry Powder Fire Extinguisher”

b) Method of operation in prominent letters.

c) The working pressure and the weight of the powder charge in Kilogramme.

d) Manufacturers name or identification mark

e) The words “RECHARGE AFTER USE” if rechargeable type.

f) Instructions to regularly check the weight of the pressure container (gas Cartridge) or inspect the pressure indicator on stored pressure types when fitted, and remedy any loss indicated by either.

g) The year of manufacture.

h) The Pressure to which the extinguisher was tested.

i) The number of this British Standard BS 3465 or BS 5423: 1977.

j) When appropriate complete instructions for charging the extinguisher shall be clearly marked on the extinguisher or otherwise be supplied with the refill.

4.6 AIR FOAM FIRE EXTINGUISHER

These shall be of 9 litres capacity complete with refills cartridges and wall fixing brackets and complying with B.S. EN 3/BS 1449 and BS 1004 with the following specifications:-

Cylinder: **to B.S. 1449**

Necking: to be 76mm outside diameter steel EN 3A $2^{3}/_{4}$ X 8TPI female thread.

Head cap: to be plastic moulding acetyl resin.

CO2 Cylinder: to be 75gm P.V.C coated.

Internal Finish: to be polythene lining on phosphate coating.

External finish: to be phosphate - One coat primer paint and one coat stove enamel B.S. 381 C.

4.7 FIRE BLANKET

The fire blanket shall be made from cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm and shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket to BS 1721.

4.8 SIGNAGE -FIRE EXIT SIGN

Proceed and procure and install as below;

Print **Fire Exit** signs on the Perspex plate, 5mm thick, with white colour background as follows:-

1. Lettering **IN RED COLOUR** of not less than 50mm in height.

2. A pendant sign bearing words, **FIRE EXIT** and with a **directional arrow**.

3. The sign must be capable of being read from both approaches to exit and so is double sided.

4.9 SIGNAGE -FIRE INSTRUCTION NOTICE

Print fire instruction on the Perspex plate, 5mm thick with White Colour Background measuring 510mm lengthx380mm width as follows;

FIRE INSTRUCTION NOTICE

In the event of fire;

(1) Raise the alarm by actuating the nearest alarm system point, Sound Siren /gong or Shout Fire

(2) Attack fire using the nearest available equipment

(3) Call fire Brigade 2222181/2 or Police 999 and inform your switchboard (PABX) Operator

(4) Ensure that all personnel not involved in fire fighting are evacuated to safety outside the building.

(5) Close but **DO NOT LOCK** doors behind as you leave.

(6) Evacuate the building using the nearest emergency exit Suitable. do not use Lifts/escalators walk calmly. Avoid panic. Do not stop or return for personal belongings.

(7) Assemble as per floor outside the building for roll call.

PART D

PARTICULAR SPECIFICATIONS

FOR

FIRE HYDRANTS

AND

FIRE SUPPRESSION SYSTEMS

PART D

PARTICULAR SPECIFICATIONS FOR FIRE HYDRANT, FIRE HYDRANTS PUMP

AND INERT GAS AUTOMATIC FIRE SUPPRESSION SYSTEM

CLAUSE.	DESCRIPTION	PAGE
7.1	General	D1
7.2	Scope of Works	D1
7.3	Fire Hydrant Details	D1
7.4	Stand Pipes	D3
7.5	Hose Pipe	D3
7.6	Fire Suppression	D4 – D15

7.1 GENERAL

This particular specification details the requirement for the supply, installation and commissioning of the Fire Hydrants and Fire Hydrant Pump. The hydrants installation shall comply in all respects to the requirements of BS. 750: 1977 or the latest version of it.

7.2 Scope of Works

The Sub-Contractor shall supply, deliver, erect, test and commission underground screw-down type fire hydrants and portable fire hydrant pumps.

7.3 FIRE HYDRANT DETAILS

(a) **Hydrant body**

The body of the hydrant shall be made of grey cast iron complying with the requirements of BS 1452 having a tensile strength not less than that given for grade 14.

(b) Hydrant Valve

The valve shall be faced with suitable resilient material. The threaded part of the valve, which engages with the spindle, shall be of bronze.

Body seating for the valves shall be of copper alloy complying with the requirements of BS 1400, or high tensile brass complying with the requirements of BS 2872 or BS 2874.

Turning the spindle cap in a clockwise direction when viewed from above shall close valves and the direction of opening shall be permanently marked on the gland.

(c) Spindle & Spindle Cap

The spindle note shall be either of the same material as the spindle, or of copper alloy complying with the requirements of BS/1400 either type LG 2 or type LG 4. It shall have a squared top formed to receive either a cast iron spindle cap.

The spindle shall be made of copper alloy complying with the requirements of BS 2874, either type CZ114 or type CZ115, and it shall have a threaded machined of trapezoidal form.

The spindle cap shall be of a cast iron secured to the spindle by on M12 hexagon socket set screw conforming to BS 4168.

(d) **Hydrant outlet**

The outlet flange of the hydrant shall have above nominal diameter 65mm, and shall be fitted with a screwed outlet – Both flanges shall be 50 mm conforming to BS 4504: Part 1: 1969

The screwed outlet shall be provided with a cap of cast iron or other suitable material. The cap shall cover the outlet thread completely and shall be attached to the hydrant by a chain

The distance between the axis of the outlet and the nearest point on the spindle fitting shall be not less than 100 mm.

The screwed outlet shall be made of

Copper alloy to BS 1400, type LG2G or DC BIC or
Copper alloy to BS 2872, type CZ114 or CZ115, or
Suitable spheroidal graphite iron to BS 2789 protected against corrosion accordance with CP 2008.

(e) Drain Boss

Each shall be provided with a suitable drain boss on the outlet side. This shall be located at the lowest practical point which will permit the filling of self-operating a drilled drip plug.

(f) Jointing

The hydrants shall have machined joint faces throughout and the fitting of adjoining parts shall be such as to make sound joints, corresponding parts of hydrants of the same design and manufacture shall be interchangeable.

(g) Hydrant **coating**
The hydrant shall be coated in accordance to BS. 4164.

(h) **Surface Box.**

The clear opening of hydrant surface boxes at ground level shall not be less than 250mm x 380mm

The depth of frame shall normally be

a) for boxes located on footpaths: 100mm
b) For boxes located in roads: 125mm

(i) Markings

Surface box covers shall be clearly marked by having the words 'FIRE HYDRANT' in letter not less than 30mm high, or the initials 'F.H.' in letters not less than 75mm high cost into the cover.

(j) Surface Box Covers & Frames.

The surface box frames and covers shall be graded in accordance with 2.1. of BS 497:1967 and shall meet the loading test requirement also given in BS 497

(k) Testing

The hydrants shall be deemed to have undergone the necessary hydrostatic and flow test at time of manufacture Necessary test certificates from the manufacturer shall be needed. The test, to conform to BS 750: 1977: Appendix a.1

7.4 **STAND PIPES**

One end of these shall have internal threads to couple with the 80mm diameter external threads of the screw down type fire Hydrant (BS750 type 2 hydrants) outlet. The other shall have 65mm diameter internal threads to couple with the interconnect or hose of the pump set

7.5 **HOSE PIPE**

Each cotton synthetic fibre rubberised fire hosepipe to be 25mm metres long with 65mm diameter female instantaneous type connector.

7.6 PARTICULAR SPECIFICATIONS FOR FIRE SUPPRESSION SYSTEMS

PROINERT SYSTEM

- **Zero Ozone Depletion Potential (ODP)** Proinert consists of Argon Nitrogen from nature. When released, they automatically return to their natural place in the environment.

- **Zero Global Warming Potential (GWP)** Argon and Nitrogen have no atmospheric lifetime, so they pose no risk to the environment.

- Similar To Air Density At discharge, the **PROINERT** gas mixture possesses a density similar to air. You can count on:
- Exceptional Extinguisher Hold Time
- Minimal Room Sealing required
- Improved Penetration from Top to Bottom of the Protected Room

- **Easy Economical Refill and Real-Life Testing** Because Argon and Nitrogen occur naturally in the environment, our extinguishant is readily available and affordable. With **PROINERT**, a real-life Discharge Testing is feasible.

- **No Secondary Combustion Products** Argon and Nitrogen do not decompose into toxic or corrosive elements in a fire, making it a safe choice for people and assets.

- **No Fogging PROINERT** is ideal for occupied spaces because escape routes remain visible.

- **No Residue** That means no damage to your equipment and no clean up required.

- Produced oxygen levels will not sustain a combustion reaction but are acceptable for human exposure over a short period of time.

PROINERT existinguishes a fire by reducing the oxygen concentration.

Globally Approved and Recognized

- UL
- FM
- LPCB
- Included in ISO 14520
- Included in EN 14520
- Included in NFPA 2001
- US EPA SNAP listed
- HAG listed
- TPED Compliant
- DOT Compliant

FROM ART TO INDUSTRY PROINERT has a wide variety of industries and applications.

- Art Galleries
- Museums
- Archive Storage
- Computer / Operation Rooms
- Control Rooms
- Financial Centers and Banks
- Electronics and data Processing
- Insurance Industries
- Military Installations
- Pharmaceutical / Medical
- Process Industry Control Rooms
- Rare Book Libraries
- Record Storage facilities
- Substation Control Rooms
- Switch Rooms
- Telecom Centers
- Universities and Colleges

Inergen Fire Suppression System
Environmental – Impact

INERGEN agent is a mixture of three naturally occurring gases; nitrogen, argon, and carbon dioxide. As INERGEN agent is derived from gases present in the earth's atmosphere, it exhibits no ozone depleting potential, does not contribute to global warming, nor does it contribute unique chemical species with extended atmosphere lifetimes. Because INERGEN agent is composed of atmospheric gases, it does not pose the problems of toxicity associated with the chemically derived Halon alternative agents.

Product Description

The INERGEN Fire Suppression System, manufactured by Ansul, is an engineered system utilizing a fixed nozzle agent distribution network. The system is designed and installed in accordance with the National Fire Protection Association (NEPA) Standard 2001, "Clean Agent Fire Extinguishing System." When properly designed, the INERGEN system will extinguish surface burning fire in Class A, B and C hazards by lowering the oxygen content below the level that supports combustion.

INERGEN agent has also been tested by FMRCA for inerting capabilities. Those tests have shown that INERGEN agent, at design concentration between 40% and 50% has successfully inerted mixtures of propane/air, and methane/air.
The system can actuated by detection and control equipment for automatic system operation along with providing local and remote manual operation as need.
Accessories are used to provide alarms, ventilation control. Door closures, or other auxiliary shutdown or functions.
When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that will allow a person to breath in a reduced oxygen atmosphere.

A system installation and maintenance manual is available containing information on system components and procedures concerning design, operation, inspection, maintenance, and recharge. The system is installed and serviced by authorized distributors that are trained by the manufacturer.

Basic Use – The INERGEN system is particularly useful for suppressing fires in hazards where an electrically nonconductive medium is essential or desirable, where clean-up of other agents present a problem; or where the hazard is normally occupied and requires a not toxic agent.

The following are typical hazards protected by INERGEN systems:

- Computer rooms
- Subfloors
- Tap storage
- Telecommunication/Switchgear
- Vaults
- Process equipment
- All normally occupied or unoccupied electronic areas where equipment is either sensitive or irreplaceable.

Composition and Materials – The basic system consist of extinguishing agent stored in high strength alloy steel cylinders. Various types of actuators, either manual or automatic, are available for release of the agent into the hazard area. The agent is distributed and discharge into the hazard area through a network of piping and nozzles. Each nozzle is drilled with a fixed orifice designed to deliver a uniform discharge to the protected area. On large hazards, where three or more cylinders are required, a screwed or welded pipe manifold assembly is employed. The cylinder(s) is connected to the distribution piping or the manifolds by means of a flexible discharge bend and check valve assembly. Different size cylinders may be connected to the same manifold.
Additional equipment Includes – Control panels, releasing devices, remote manual pull stations, corner pulleys, door closures, pressure trips, bells and alarms, and pneumatic switches. All or some are required when designing a total system.

INERGEN Agent
INERGEN agent is a mixture of three inerting (oxygen diluting) gases: 52% nitrogen, 40% argon, and 8% carbon dioxide. INERGEN gas extinguishes fire by lowering the oxygen content below the level that supports combustion. When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that still allow a person to breath in a reduced oxygen atmosphere. It actually enhances the body's ability to assimilate oxygen. The normal atmosphere in a room contains 21% oxygen and less than 1% carbon dioxide. If the oxygen content is reduced below 15%, most ordinary combustibles will cease to burn. INERGEN agent will reduce the oxygen content to approximately 12.5% while increasing the carbon dioxide content to about 4%. The increase in the carbon dioxide content increased a person's respiration rate and the body's ability to absorb oxygen. Simply state, the human body is stimulated by the carbon dioxide to breathe more deeply and rapidly to compensate for the lower oxygen content of the atmosphere.

Cylinders – The cylinders are constructed, tested, and marked in accordance with applicable Dept. of Transportation (DOT) and the U.S. Bureau of Explosives specifications. As a minimum, the cylinders must meet the requirements of DOT 3AA2300 or 3AA2015+.

Cylinder Assembly – the cylinder assembly is of steel construction with a red standard finish. Four sizes are available to meet specific needs. Each is equipped with at pressure seat-type valve equipped with gauge. The valve is constructed of forged brass and is attached to the cylinder providing a leak tight seal. The valve also includes a safety pressure relief device which provides relief at 2900-3300 psi (20685-23167 kPA) pre CGA test method. Cylinder charging pressure is 2175 psi at 70ºF (14997 kPA at 21º C). The cylinder are shipped with a maintenance record card and shipping cap attached. The cap attached to the threaded collar on the neck of each cylinder to protect the valve while in transit. The cylinder serial number and date of manufacture are stamped near the neck of each cylinder.

Electric Solenoid Actuator – Electric actuation of an agent is accomplished by an electric solenoid actuator interfaced through an AUTOPULSE ® Control system. This actuator can be used in hazardous environments where the ambient temperature range is between 32ºF (0 ºC and 54 ºC). in auxiliary or override applications, a manual lever actuator can be installed on top of the cylinder valve.
Manual or Pneumatic Actuators – Two types of manual/pneumatic actuators are available for lever actuation of the cylinder valve. Manual actuation is accomplished by pulling the hand lever on the actuator. The lever design contains a forged mechanical detent which secures the lever in the open position when actuated. A pneumatic actuator is available to provide a pneumatic means for a remote pressure release from a remote pressure device.

Detection System – The AUTOPULSE Control System is used where an automatic electronic system is required to actuate the INERGEN system. This control system is used to control a single fixed fire suppression or alarm system based on inputs received from fire detection devices. The detection circuits can be configured using cross, counting, independent or priority-zone (counting) concepts. The control system has been tested to the applicable FCC Rules and Regulations for Class A Computing devices.

Nozzles – Nozzles are designed to direct the discharge of INERGEN agent using the stored pressure from the cylinders. Five sizes of nozzles are available. The system design specifies the nozzle and orifice size to be used for proper flow rate and distribution pattern. The nozzle selection depends on the hazard and location to be protected.
Orifice Union – The orifice union is required in the distribution piping to restrict the flow of INERGEN agent, thus reducing the agent pressure down stream of the union. The union contains a stainless steel orifice plate which is drilled to the specifics size hole required based on the hydraulic calculation. The orifice plate provided readily visible orifice identification. The orifice is available in eight sizes ½ in, ¾ in, 1 in, 1¼ in,1½ in, 2 in, 2½ in, and 3 in, NPT>

Pipe and Fittings – The system manifold must be constructed of Schedule 80 piping and class 2000 or 300lb. steel fitting, threaded or welded. The distribution piping down stream from the orifice union must be constructed of a minimum of Schedule 40 piping with class 300 malleable iron threaded fittings. All the following type must be black or galvanized. All piping must be black or galvanized steel of the following type and grade. ASTM A-53 seamless or electric resistance welded, grade A or B, or ASTM A-106 grade A, B, or C. **Do not use ASTM A-120, ASTM A-53 type F or ordinary castiron pipe or fittings.**

Limitations – The INERGEN system must be deigned and installed within the guidelines of the manufacturer's design, installation, operation, inspection, recharge, and maintenance manual. The ambient temperature limitations are 32 ºC to 130 ºF (0 ºC t0 54 ºC). All AUTOPULSE. Control Systems are designed for indoor application and for temperature ranges 32 ºF and 120 ºF (0 º and 49 º C)

Technical Data

Applicable Standards: The INERGEN system complies with NEPA Standard 2001, Standard for Clean Agent Fire Extinguisher Systems, and EPA Program SNAP, Significant New Alternate Policy.

Agent is listed and approved by Underwriters Laboratories, Inc. (UL) and factory Mutual Research Corporation (FMRC).

Installations

All system components and accessories must be installed by personnel trained by the manufacturer. All installations must be performed according to the guidelines stated in the manufacturer's design, installation, operation, inspection, recharge and maintenance manual.

Availability and Cost

Availability – INERGEN Systems are sold and serviced through an international network of independent distributors located in most states and many foreign countries.

Cost – Cost varies with type of system specified, size, and design.

Product Warranty

Warranty – The components of the fire suppression system supplied by Ansul Fire Protection ("Ansul") are warranted to you as the original purchaser for one year from the date of delivery against the defects in workmanship and material. Ansul will replace or repair and Ansul supplied components, which, in its opinion, are defective and have not been tampered with or subjected to misuse, abuse or exposed to highly corrosive conditions provided that written notice of the alleged defect shall have been given to Ansul within 30 days after discovery thereof and prior to the expiration of one year after delivery, and further provided that if Ansul so instructs, such article or part thereof is promptly returned to Ansul with shipping charges prepaid.

Disclaimer of Warranty and Limitation of Damage – the warranty described above is the only one given by Ansul concerning this system. ANSUL MAKES NO OTHER WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE. ANSUL'S MAXIMUM RESPONSIBILITY FOR ANY CLAIMS WHETHER IN CONTRACT, TORT, NEGLIGENCE, BREACH OF WARRANTY, OR

STRICT LIABILITY SHALL BE LIMITED TO THE PURCHASE PRICE OF THE SYSTEM. UNDER NO CIRCUMSTANCES SHALL ANSUL BE RESPONSIBLE FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES OF ANY KIND. Ansul does not assume or authorize any other person to assume for it any additional liability in connection with the sale of this system.

For repairs, parts, and service or the Ansul fire suppression system, contact a local Ansul representative, or Ansul Fire protection, Marinette, WI 54143-2542, 800-TO ANSUL (862-6785)

False Discharge Warranty

Subject to the conditions set forth below, Ansul will, as purchaser's sole remedy, replace INERGEN gas and pay reasonable costs to recharge the INERGEN/ Detection and Control System where, in Ansul's opinion, the discharge has occurred due to a defect in the material or workmanship of the products provided by Ansul. This warranty is extended only to the original purchaser of the INTERGEN/Detection and Control System.

Ansul will only replace INERGEN gas and pay reasonable costs to recharge the INERGEN / Detection and Control System where, in Ansul's opinion, the discharge has occurred due to a defect in the material or Workmanship of the products provided by Ansul. For example, Ansul will not be responsible for discharges due to faulty maintenance or installation or service, intentional acts by the owner or their parties, or circumstances over which Ansul has no control. Ansul will not be responsible for discharges of the

INERGEN /Detection and Control System which occur if the INERGEN/Detection and Control System, as initially installed, has been altered or modified.

D8

This warranty shall be effective only if the original purchaser maintains a semi-annual service agreement for the INERGEN/Detection and Control System with an Authorized Ansul Distributors from the date of installation. This warranty covers only the INERGEN/Detection and Control Systems purchased from
Ansul or its Authorized Distributors and only those INERGEN/Detection and Control System which incorporate and use only hardware and components, including detection and contol devices manufactured, sold, or approved by Ansul. This warranty may not be.

ANSUL
Features

- Low pH Agent
- Proven design
- Reliable Cartridge Operated
- Aesthetically Appealing
- UL Listed – Meets Requirements of UL 300

Application

The Ansul R-102 Restaurant Fire Suppression System is an automatic, pre-engineered, fire suppression system designed to protect the following areas associated with cooking equipment; ventilating equipment including hoods, ducts, plenums, and filters; fryers; griddles and range tops; upright, natural charcoal, or chain-type broilers; electric, lava rock, mesquite or gas-radiant char-broilers and woks.

The system is ideally suitable for use in restaurants, hospitals, nursing homes, hotels, schools, airports, and other similar facilities.

Use of the R-102 system is limited to interior applications only. The regulated release and tank assemblies must be mounted in an area where the air temperature will not fall below 32 ºF (0 ºC) or exceed 130 ºF
(54 ºC). The system must be designed and installed within the guidelines of the UL Listed design, installation, Recharge, and Maintenance Manual.

System Description

The restaurant fire suppression system is a pre-engineered, wet chemical, cartridge-operated, regulated pressure type with a fixed nozzle agent distribution network. It is listed with Underwriters Laboratories,
Inc (UL).
The system is capable of automatic detection and actuation and / or remote manual actuation. Additional equipment is available for mechanical or electrical gas line shut-off applications.

The detection portion of the fire suppression system allows for automatic detection by means of specific alloy rated fusible links, which, when the temperature exceeds the rating of the link, the link separates, allowing the regulated releaser to actuate.
A system owner’s guide is available containing basic information pertaining to system operation and maintenance. A detailed technical manual is also available including system description, design,
installation , recharge, and maintenance procedures, plus additional equipment installation and resetting instructions.

The system is installed and serviced by authorized distributors that are trained by the manufacturer.
The basic system consists of an ANSUL AUTOMATION regulated release assembly which includes a regulated release mechanism and a wet chemical storage tank housed within a single enclosure. Nozzle blow-offs caps, detectors, cartridges, agent fusible links, and pulley elbows are supplied in separate packages in the quantities needed for fire suppression system arrangements.
Additional equipment includes remote manual pull station, mechanical and electrical gas valves, pressure switches, and electrical gas line shut-off. Accessories can be added such as alarms, warning lights etc, to installation where required.
Tanks can be used in multiple arrangements to allow for larger hazard coverage. Each tank is limited to a listed maximum amount c flow numbers.

Component Description

Wet Chemical Agent – The extinguishing agent is a mixture of organic and inorganic salts designed for rapid flame knockdown and foam securement of grease related fires. It is available in plastic containers with instructions for wet chemical handling and usage.

Agent Tank – The agent tank is installed in a stainless steel enclosure or wall bracket. The tank is deep drawn carbon steel finished in red enamel.

Tanks are available in two sizes: 1.5 gallon (5.7L) and 3.0 gallon (11.4L). The tanks have a working pressure of 100psi (6.9 bar), a test pressure of 300 psi (20.7 bar), and a minimum burst pressure of 600 psi. (41.4 bar).

The tank included an adaptor /tube assembly. The adaptor is chrome-plated steel with a ¼ in. NPT female gas inlet and 3/8 in. NPT female agent outlet. The adaptor also contains a bursting disc seal which prevents the siphoning of agent up the pipe during extreme temperature variations.

Regulated Release Mechanism – The regulated release mechanism is a spring-loaded mechanical/pneumatic type capable of providing the expellant gas supply to one or two agents tanks, depending on the capacity of the gas cartridge uses. It contains a factory installed regulator deadest at 100 psi (6.9 bar) with an internal relief of approximately 145 psi (10.0 bar). It has automatic actuation capabilities by a fusible link detection system and remote manual actuation by a mechanical pull station.
The regulated release mechanism contains a release assembly, regulator, expellant gas hose, and agent storage tank housed in a stainless steel enclosure with cover. The enclosure contains knock-outs for ½ in. conduit. The cover contains an opening for a visual status indicator.

It is compatible with mechanical gas shut-off devices; or when equipped with a field or factory-installed switch , it is compatible with electric gas line or appliance shut-off devices.

Regulated Actuator Assembly – When more than two agents tanks are required, the regulated actuator is available to provide expellant gas for additional tanks. It is connected to the cartridge receiver outlet of the regulated actuator deadest at 100 psi (6.9 bar) with an internal relief of approximately 145 psi (10.0 bar). The regulated actuator assembly contains a regulated actuator, regulator, expellant gas hose, and agent tank housed in a stainless steel enclosure with cover. The enclosure contains knockouts to permit installations of the expellant gas line.

Discharge Nozzles – each discharge nozzle is tested and listed with the R-102 system for a specific application. Nozzle tips are stamped with the flow number designation (1/2, 1, 2, and 3). Each nozzle must have a metal or rubber blow-off cap to keep the nozzle tip orifice free of cooking grease build-up.

Approval

Applicable Standards: ULI listed under EX3470; ULC listed under CEX-747; meets requirements of NFPA 96 (Standard for the installation of Equipment for the Removal of Smoke and grease-Laden Vapors from Commercial Cooking Equipment); NFPA 17A (Standard on Wet Chemical Extinguishing Systems)

Ordering Information

Order all systems components through your local authorized Ansul Distributor.

Specifications

An Ansul R102 Fire Suppression System shall be furnished. The system shall be capable of protecting all hazard areas associated with cooking equipment.

1.0 General **1.1 References**

1.1.1 Underwent Laboratories, Inc. (UL)

1.1.1 UL Standard 1254

1.1.1.2 UL Standard 300

1.1.2 National Fire Protection Association (NFPA)

1.1.2.1 NFPA 96

1.1.2.1 NFPA 17A

1.2 Submittals

1.2.1 Submit two sets of manufacturer's data sheets

1.2.1 Submit two sets of piping design drawings

1.3 System Description

1.3.1 The system shall be an automatic fire suppression system using a wet chemical agent for grease related fires.

1.3.2 The system shall be capable of suppressing fires in the following area associated with cooking equipment: ventilating equipment including hoods, ducts, plenums, and filter fryers; griddles and range tops; upright, natural charcoal, or chain-type broilers; electric, lava rock, mesquite or gas-radiant char-broilers.

1.3.3 The system shall be the pre-engineered type having minimum and maximum guidelines established by the manufacturer and listed by underwriters Laboratories, Inc, (UL)

1.3.4 The system shall be installed and serviced by personnel trained by the manufacturer.

1.4 Quality Control

1.4.1 Manufacturer: The R-102 Restaurant Fire Suppression System shall be manufactured by a company with at least thirty years experience in the design and manufacture of Pre-engineered fire suppression systems. The manufacturer shall be ISO 9002 registered

1.4.2 Certificates: The wet agent shall be a specially formulated, aqueous solution of organic salts with a pH range between 7, 8 -8.2, designed for flame knockdown and foam securement of grease-related fires.

1.5 Warranty, disclaimer, and Limitations

1.5.1 The pre-engineered restaurant fire suppression system components shall be warranted for five years from date of delivery against defects in workmanship and material.

1.6 Delivery

1.6.1 Packaging: All system components shall be securely packaged to provide protection during shipment.

1.7 Environmental Conditions

1.7.1 The R-102 system shall be capable of operating in a temperature range of 32º F to 130 º F (0 ºC to 54 ºC).

2.0 Product 2.1.1 Ansul fire Protection, One Stanton Street, Marinette, Wisconsin 54143-2542, Telephone (715) 735-7411.

2.2 Components

2.2.1 The basic system shall consist of ANSUL AUTOMAN regulated release assembly which includes a regulated release mechanism and a wet chemical storage tank housed within a single enclosure. Nozzle, blow-off caps, detectors, cartridges, agent, fusible links, and pulley elbows shall be supplied in separate packages in the quantities needed for fire suppression system arrangements. Additional equipment shall include remote manual pull station, mechanical and electrical gas valves, pressure switches, and electrical switches for automatic equipment and gas line shut-off.

2.2.2 Wet Chemical Agent: The extinguishing agent shall be a specially formulated, aqueous solution of organic salts with a pH range between 7,8 – 8.2, designed for flame knockdown and foam securement of grease related fire.

2.2.3 Agent Tank: The agent tank shall be installed in a stainless steel enclosure or wall bracket. The tank shall be deep drawn carbon steel finished in red enamel. Tanks shall be available in two sizes: 1.5 gallon (5.7L) and 3.0 gallon (11.4L). The tanks shall have a working pressure of 100 psi (6.9 bar), a test pressure of 300 psi (20.7 bar), and a minimum burst pressure of 600 psi. (41.4 bar.

2.2.4 Regulated Release Mechanism: The regulated release mechanism shall be a spring-loaded mechanical/pneumatic type capable of providing the expellant gas supply to one or two agents tanks, depending on the capacity of the gas cartridge used. It shall contains factory installed regulator deadest at 100 psi (6.9 bar) with an internal relief of approximately 145 psi (10.0 bar).

It shall have the following actuation capabilities: automation actuation by a fusible link detection system and remote manual actuation by a mechanical pull station.

The regulated release mechanism shall contain a release assembly, regulator, expellant gas hose, and agent storage tank housed in a stainless steel enclosure with cover. The enclosure shall contains knock-outs for ½ in. conduit. The cover shall contain an opening for a visual status indicator.

It shall be compatible with mechanical gas shut-off devices; or when equipped with a field or factory-installed switch, it shall be compatible with electric gas line or appliance shut-off devices.

2.2.5 Regulated Actuator Assembly: When more than two agents tanks are required, the regulated actuator shall be available to provide expellant gas for additional tanks. It shall be connected to the cartridge receiver outlet of the regulated release mechanism providing simultaneous agent discharge. The regulator shall be deadest to 100 psi (6.9 bar) with an internal relief of approximately 145 psi (10.0 bar). The regulated actuator assembly shall contains a regulated actuator, regulator, expellant gas hose, and agent tank housed in a stainless steel enclosure with cover. The enclosure shall contains knockouts to permit installations of the expellant gas line.

2.2.6 Discharge Nozzles: Each discharge nozzle shall be tested and listed with the R-102 system for a specific application. Nozzle tips shall be stamped with the flow number designation (1/2, 1, 2, and 3). Each nozzle shall have a metal or rubber blow-off cap to keep the nozzle tip orifice free of cooking grease build-up.

2.2.7 Distribution Piping: Distribution piping shall be schedule 40 black iron, chrome-plated, or stainless steel pipe conforming to ASTM A120, A53, or A106.

2.2.8 Detectors: The detectors shall be the fusible link style designed to separate at a specific temperature.

2.2.9 Cartridges: The cartridge shall be a sealed steel pressure vessel containing either carbon dioxide or nitrogen gas. The cartridge seal shall be designed to be punctured by the releasing device supplying the required pressure to expel wet chemical agent from the storage tank.

3.0 Implementation 3.1 Installation

3.1.1 The R-102 fire suppression system shall be designed , installed, inspected, maintained, and recharged in accordance with the manufacturer's listed instruction manual.

3.2 Training

3.3.1 Training shall be conducted by representative of the manufacturer.

(b) **Halon 1301**

For many years Halon has received extensive application as a fire suppression system for electrical and electronic equipment.

However due to its ozone depletion effects, production of Halon has been discontinued through the Montreal protocol which was signed on 16 September, 1987 and put in force on 7th February, 1989.

c) **Inergen**

Inergen is a mixture of Nitrogen, Argon and Carbon Dioxide in a 52, 40 and 8% ratio respectively. Oxygen being the main ingredient in combustion, inergen suppresses fire by reducing the oxygen content below the critical level required for combustion to take place.
However, reducing the level of oxygen substantially in any enclosure inhibits breathing making it difficult for the building occupants to operate. To overcome this the small percentage of carbon dioxide contained in inergen results in a higher breathing rate enabling people to function normally (see attached extract from an Inergen System Manual).

d) **Hi-Fog**

the main component of Hi-fog fire suppression system is distilled water. The water droplets turn into stream at high speed thus absorbing energy from the fires. The average droplets in Hi-fog yield a total surface area of atleast 100 times greater than Conventional Sprinkler drops for the same water volume, and therefore much smaller amounts of water are required. Due to te light weight of the droplets it would be difficult to penetrate the flue gases produced by the combustion source, however to overcome this, the fog discharge at high pressure through specially developed nozzles. The Hi-fog system has high pressure water fog for extinguishing and low pressure fog for cooling the source of fire thus reducing the risk of re-ignition.
In operation hi-fog acts like a gas and fills every part of a room even where the fog spray is not directed. The low water volume implies that Hi-fog has little or no damage on paper or computer equipment. Hi-fog fire suppression system is readily available in the market and therefore easy to replenish.

e) FM 200

FM 200 is the closest and most suitable replacement for Halon 1301.”Preussag” FM 200 is environmental friendly being safe for use in both occupied and unoccupied spaces.

FM200 system is operated by an automatic fire detection system specifically designed for extinguishant release.

Like the Hi-fog system described above EM200 operates by absorbing chemical energy from the combustion process so that the temperature falls below the critical points as flame propagation cannot exist below 1300ºC.
FM200 total flooding fire suppression system ha the following advantages:

(i) FM200 does not remove significant quantities of oxygen due to the low concentration required to extinguish a fire, and hence does not impede human breathing.

(ii) The toxicity of FM200 is low and within acceptable limits.

(iii) FM200 does not obstruct vision

(iv) FM200 is quickly cleared by natural ventilation and ha zero ozone depletion potential.

General Comments

The above fire suppression agent are stored in re-usable mild steel cylinders size: 200mm dia by 820mm high for 20kg cylinder and size: 230mm dia by 1530mm high for a 50Kg cylinder. Every cylinder is fitted with a discharge valve and integral pressure gauge.

Large cylinder sizes have a level indicator which allows the facilities annual check without having to disconnect the container from the pipework.

From the cylinder the suppressant is plumbed into various stations via suitably sized steel pipes (seamless) properly clipped along the building walls at high level and terminating at the roof level discharge nozzles.

Central location of the storage cylinders is preferred as this has an advantage in both security and maintenance. These cylinders require a storage area on ground floor measuring; 2m by 2m and located either within the building or externally.

SECTION E

BILLS OF QUANTITIES

AND

SCHEDULE OF UNIT RATES

BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

CONTENTS

CLAUSE No.		PAGE
1.	GENERAL NOTES TO TENDERERS……	E-1 to E-2
2.	BILLS OF QUANTITIES ……	E-3 to E-28
3.	SUMMARY PAGE……	M/S
4.	SCHEDULE OF UNIT RATES……	E-29 – E-30

BILLS OF QUANTITIES

VOLUME 1

SPECIAL NOTES

1. The Bills of Quantities form part of the contract documents and are to be read in conjunction with the contract drawings and general specifications of materials and works.

2. All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part thereof.

3. The brief description of the items given in the Bills of Quantities are for the purpose of establishing a standard to which the sub-contractor shall adhere. Otherwise alternative brands of **equal** and **approved** quality will be accepted.

   Should the sub-contractor install any material not specified here in before receiving **Written approva**l from the Project Engineer, the sub-contractor shall remove the material in question and, **at his own cost**, install the proper material.

4. The grand total of prices in the price summary page must be carried forward to the **Form of Tender for the tender to be deemed valid**.

4. Tenderers must enclose, together with their submitted tenders, detailed manufacturer's Brochures detailing Technical Literature and specifications on all the equipment they intend to offer.

Statement of Compliance

I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.

I confirm I have not made and will not make any payment to any person, which can be perceived as an inducement to win this tender.

Signed: ……. *for and on behalf of the Tenderer*

Date: ……

Official Rubber Stamp: ……

BILLS OF QUANTITEIS

Plumbing, Drainage

&

Fire Fighting

COMMON SERVICES					
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	External Water Reticulation				
	Supply & Install PPR Pipe work				
A	50mm diameter pipe	LM	480		
B	40mm diameter pipe	LM	270		
	Bends				
C	50mm diameter bend	No	121		
D	40mm diameter bend	No	127		
	Tees				
E	50mm diameter tee	No	85		
F	40mm diameter tee	No	84		
	Reducers				
G	50 x 40mm diameter reducer	No	75		
H	40 x 32mm diameter reducer	No	64		
	Valves				
I	50mm diameter gate valve	No	21		
J	40mm diameter gate valve	No	24		
	Unions				
K	50mm diameter pipe union	No	68		
L	40mm diameter pipe union	No	54		
	Flanged Coupling				
M	50mm diameter flanged coupling	No	11		
N	40mm diameter flanged coupling	No	10		
O	Allow for sterilization of the entire Plumbing Pipework and Tanks with chlorine to Engineers Approval.	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic – Common Services Total Carried Forward To Collection Page				
			E/3		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Water Booster Pumpset				
A	Set of automatic electrically driven twin booster pump. One duty and the other one standby with automatic changeover, capable of delivering 6m³hr against a head of 35metres with a 1.5kW,1ph power source. The pumpset shall be complete with pressure vessel. 2No.Float switches and all accessories required for proper and satisfactory operation. It includes pressure switches, time delay switch, a switch to protect against dry run, timer, gate valves, non-return valves, water level indicator, float level regulator, 50mm diameter foot valve and strainer. The pump to be as **Pedrollo CPm 190** or approved equivalent. Pump to be installed on mild steel frame with approved paint.	Set	1		
	Hatchery Water Retirculation Pumpset				
B	Set of automatic electrically driven twin end suction centrifugal pumpset. One duty and the other one standby with automatic changeover, capable of delivering 10m³hr against a head of 15metres with a 1.5kW. The pumpset shall be complete with pressure vessel. 1No.Float switches and all accessories required for proper and satisfactory operation. It includes pressure switches, time delay switch, a switch to protect against dry run, timer, gate valves, non-return valves, water level indicator, float level regulator, 75mm diameter foot valve and strainer. The pump to be as **Dayliff DE40/20** or approved equivalent. Pump to be installed on mild steel frame with approved paint.	Set	1		
	Control Panel				
C	Control panel for above pumps with contactors, over voltage and under voltage protection relays, MCBs, phase failure protection, timer, start/stop push buttons and indicator lights. All these shall be housed in a lockable cabinet (with integral isolator) made from SWG 18 mild steel sheet that is oven powder coated.	Item	2		
	Sump Pump				
D	A submersible pump capable of delivering 6m³/hr against 5M head, power rating 1kW, 1phase, 50Hz as **Pedrollo model Top 2** or equal and approved complete with control panel, associated electrical works, protection against dry run, on/off neon lights, control/pump status display panel, audio alarm with manual silencer to indicate when the pump is faulty, float switch and all necessary controls.	No	0		
	Hose Reel Water Storage Tank				
E	Supply & Install Plastic cylindrical moulded tank of capacity 10,000 Litres. The tank to be assembled complete with cover and having screwed connections for inlet, outlet, overflow, 32mm high pressure ball valve, drain pipes and any other necessary item for its proper functioning. The tank shall be mounted on a flat slab and shall be as Kentainers Model or approved equivalent.	No	1		
	Proposed (B-STEP), Kisumu Polytechnic – Common Services Total Carried Forward To Collection Page				
			E/4		

	Fire Fighting Services				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Supply and install the following fire fighting equipment in positions indicated or as shall be instructed by the Engineer.				
	Hose Reel System				
	Hose Reel				
A	Swinging type hosereel fitted with 30 metres long, 20mm diameter reinforced non-kink rubber hose with 5/6 mm lever operated shut-off nozzle, mild steel feed pipe, isolation valve, guide and all other accessories as **"Bristol Fire"** or equal and approved.	No.	12		
	Hose Reel Pumpset				
B	A Set of Automatic Electrically driven Twin pumps. One duty and the other one standby with automatic changeover, capable of delivering $3m^3hr$ against a head of 40metres with a 1.5kW,1ph power source. The pumpset shall be complete with 24L pressure vessel, pressure switches, time delay switch, a switch to protect against dry run, gate valves, non-return valves, strainer & and all accessories required for proper and satisfactory operation. The pump to be as **Dayliff DFS2** or approved equivalent. Pump to be installed on mild steel frame with approved paint.	Set	1		
	GMS Pipe Class B				
C	20mm diameter pipework	LM	150		
D	25mm diameter pipework	LM	160		
E	32mm diameter pipework	LM	250		
F	40mm diameter pipework	LM	254		
G	50mm diameter pipework	LM	296		
	Extra Over Pipework				
	Bend				
H	25mm diameter bend	No.	125		
I	32mm diameter bend	No.	124		
J	40mm diameter bend	No.	124		
K	50mm diameter bend	No.	104		
	Tee				
L	25mm diameter equal tee	No.	134		
M	32 mm diameter equal tee	No.	114		
N	40 mm diameter equal tee	No.	101		
O	50 mm diameter equal tee	No.	189		
	Reducer				
P	25 x 20 mm diameter reducer	No.	124		
Q	32 x 25 mm diameter reducer	No.	116		
R	50 x 32 mm diameter reducer	No.	102		
	Valve				
S	40mm diameter approved medium pressure screw down full way non-rising stem wedge gate valve to BS 1952, with wheel and head joints to steel tubing. The gate valve to be as **'' Pegler''** or approved equivalent.	No.	9		
T	20mm diameter gate valve ditto	No.	24		
U	25mm ditto	No.	21		
V	32mm Non return Valve	No.	15		
	Union				
W	25mm diameter pipe union	No.	147		
X	32mm diameter pipe union	No.	178		
	Painting				
Y	Allow for painting of the hose reel pipework as per particular specifications.	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic – Common Services **Total Carried Forward To Collection Page**				
			E/5		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	External Gardening Services				
	To Supply and Install the following				
A	Excavate trench in murram soil for 450mm wide x 600mm deep including back fill, cart away	Lm.	500		
B	32mm dia HDPE class E pipe	Lm.	300		
C	25mm dia ditto	Lm.	250		
D	32mm dia bend	No.	96		
E	25mm dia ditto	No.	44		
F	32mm dia Tee	No.	34		
G	25mm dia ditto	No.	52		
H	32mm dia gate valve as "Peglar's"	No.	16		
I	32mm dia Air relief valve	No.	5		
J	32mm dia Peglar's Non-Return valve	No	10		
K	15mm stand pipe with threaded nozzle Peglar's hose tap and 150x50mm Key Terrain floor trap with 5mlong, 100mm dia UPVC class B perforated drain pipe.	No.	15		
	Proposed (B-STEP), Kisumu Polytechnic – Common Services Total Carried Forward To Collection Page				
			E/6		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	<u>Collection Page - Common Services</u>				
	Bill No.1 : External Water Reticulation				
	Bill No.2 : Water Pumpsets				
	Bill No.3 : Hose Reel System				
	Bill No.4 : External Gardening Services				
	Proposed (B-STEP), Kisumu Polytechnic – Common Services **Total Carried Forward To Collection Page**				
			E/7		

	ADMINISTRATION BLOCK				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Sanitary Fittings-Apartments				
	To supply and install the following Sanitary fittings including all the necessary joints to service overflow and waste pipes, jointing's and motices, plugs, screws bolts and making good. Sanitary Fittings will be to Engineer's & Interior Designers' approval of the relevant samples				
	Water Closet				
A	Close Coupled WC with 'P'-trap complete with horizontal outlet to BS 3402 with dual flush button and heavy duty plastic seat and cover with heavy duty steel hinges. All to be as **"Twyford"** or equal an approved	No.	6		
B	Ditto but floor standing with concealed toilet flush valve	No.	0		
C	**Disabled Persons Water Closet and Wash Hand Basin Facility**				
	Wheel chair accessible W.C facility Comprising of the following:-	No.	1		
	i) Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow. The bowl shall be of size 375x560x420mm high. The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402 .The unit shall be complete with valveless cistern fittings including syphon, 15mm side inlet ball valve, 20mm side overflow, plastics flushbend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat(25mmhigh) and cover with chrome plated metal hinges, toilet roll holder, 600 x 600 x 6mm thick mirror and robe hook.				
	ii) Semi pedestal wall mounted W.H.B of size 600x500x545mm high with flexible connectors to waste and taps. The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 1/2'' Self Closing Tap,Pillar type, chrome plated waste with height adjustable trap, pedestal and wall fixing bolts.				
	iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate plate size 230x100 mm, 4No 600mm grab rails with covered wall plates. The set shall be as **Twyford** DOC.M wheelchair accessible W.C. facility or approved equivalent.				
	Wash Hand Basin				
D	Countertop wash hand basin size 460 x330x430mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, Cobra single lever Mixer tap and heavy duty plastic bottle trap (32mm 'P' trap) with 75mm seal. All to be as **"Twyford"** or equal and approved.	No.	0		
E	Ditto but Wall hung Semi pedestal	No.	10		
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block Total Carried Forward To Collection Page				
			E/8		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Urinals bowls				
A	Ceramic urinal bowl complete with 40mm heavy duty plastic bottle trap and 40mm diameter chrome plated outlet with grating firmly fixed on the wall with chrome plated screws. The fittings shall be as **"Twyford"** or equal and approved.	No.	3		
	Urinal Bowl Divisions				
B	Ceramic urinal bowl divisions' separating the above-described urinal bowls fixed firmly on the wall. The fittings shall be as **"Twyford"** or equal and approved.	No.	3		
	Urinal Flush Valve				
C	Concealed Delay Action Urinal Flush Valve **"Twyford"** or equal and approved.	No.	3		
	Robe Hook				
D	Aluminium Robe hook with door stopper in Matte Black Colour to be mounted by concealed screws to wall wedges. To be as **"Plumber"** accessories or equal and approved.	No.	6		
	Towel Ring				
E	**"Plumber"** Towel ring size 225mm dia with SS dome headed screws.	No.	2		
	Toilet Roll Holder				
F	Stainless steel toilet roll holder as **"Plumber"** or equal and approved.	No.	6		
	Toilet Brush Holder				
G	Toilet brush holder as **"Plumber"** or approved equivalent.	No.	6		
	Paper Towel dispenser				
H	Wall-mounted manual paper towel dispenser as **"Mediclinics"** or equal and approved.	No.	4		
	Mirror				
I	6mm thick polished plate glass silver backed mirror with bevelled edges, size:600mm dia, Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	No.	6		
	Arabic Shower				
J	**' Twyford '' or equal** Arabic Shower complete with wall hook	No	2		
	Hand Drier				
K	Automatic hand drier in white colour, operating on an infra-red automatic sensing system with heating element safety cut-out complete with a 30 seconds safety timer, plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 1.5kW and performance flow rate of 135cfm (4.22m³/min) and to be of size 305x225x154mm deep It shall have a noise level below 57 dBA at 2m. It shall be as **Medclinics** or approved equivalent.	No.	2		
	Proposed (B-STEP) ,Kisumu Polytechnic – Administration Block **Total Carried Forward To Collection Page**				
			E/9		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Shower Fitting				
A	Shower fitting consisting of the concealed 4 way diverter single lever shower mixer or approved equivalent and 200mm diameter swivel/ adjustable rain shower rose , shower arm and other necessary fittings and accessories. All to be as Cobra or equal and approved	No	2		
	Towel Rail				
B	Stainless Steel towel rail 20mm diameter by 1000mm long with the rail and brackets as one piece, all as **" Twyford "** or equal and approved.	No.	2		
	Soap and Sponge Tray				
C	Stainless steel soap and sponge tray in approved colour. As **" Twyford "** or equal and approved.	No	2		
	Kichen sink				
D	Double bowl sink INSET size:860x 420 x200mm complete with Single Lever Cobra mixer tap swivel , plastic bottle trap, Pop-up & waste plug	No	1		
E	Ditto but double bowl, double drain Size:1500x490x200mm deep	No	0		
	Cleaners Sink				
F	**"Twyford"** or equal stainless steel cleaners sink size 500x480x280mm INSET to be fixed on concrete counter to inclusive of Cobra single lever tap grid waste fitting pad, plastic bottle trap.	No	0		
	Instant Shower Heater				
G	**'Lorenzetti''** Instant shower Heater as **"Lorenzetti"** or equal and approved.	No.	2		
	Instant Heater -5L				
H	**'Lorenzetti ''** under sink instant heater complete	No.	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Administration Block **Total Carried Forward To Collection Page**				
			E/10		

	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Laboratory Sink (SBSD)				
A	Supply and install a heavy-duty laboratory sink of chemical-resistant polypropylene (PP), epoxy resin, or acid-resistant stainless steel, size approximately 1,000mm × 450mm × 200mm deep, with a seamless single bowl and single drain outlet. Complete with overflow, waste fitting, waste plug and chain, plastic bottle trap, elbow-action mixer tap, and all necessary plumbing connections and accessories..The fitting to be "Ideal standard"or equal and approved.	No	10		
	Deck-Mounted Eyewash Eyewash Unit				
B	Supply and install a deck-mounted laboratory eyewash station complete with twin spray heads, dust covers, stay-open valve, and corrosion-resistant fittings, capable of providing an immediate hands-free flow of potable water for emergency eye flushing, complete with all necessary accessories and connections.	No	3		
	Chemical Neutralization Chamber				
C	Supply and install a 100-litre chemical neutralization chamber for laboratory wastewater, fabricated from chemical-resistant HDPE or PP, complete with neutralizing media, inlet and outlet connections, access cover, and all necessary fittings and accessories, including testing, commissioning, and full installation for safe neutralization of acidic and alkaline effluents prior to discharge in accordance with project specifications and applicable regulations.	No	2		
	Proposed (B-STEP) ,Kisumu Polytechnic – Administration Block **Total Carried Forward To Collection Page**				
			E/11		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No1: SANITARY APPLIANCES				
	Collection Page – Administration Block				
	Brought forward from Page E/8				
	Brought forward from Page E/9				
	Brought forward from Page E/10				
	Brought forward from Page E/11				
	Proposed (B-STEP) ,Kisumu Polytechnic – Administration Block **Total Carried Forward To Main Collection Page**				
			E/12		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Internal Plumbing				
	Supply and install Polypropylene (PPR) pipes PN20, tubing and fittings as described and shown on the drawings. The pipes shall be produced as per SDR 11 and shall meet or exceed the requirements as of ASTM D 2846, current European standards for PPR installations and to the Engineers approval. All joints shall be assembled employing solvent cements that meet or exceed the requirements of ASTM F442 and ASTM F441. Rates must allow for all Metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints, support raceways, isolating sheaths, elastic materials, expansion arms and bends, crossovers, 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. The pipes will be pressure tested before the plastering of wall commences and as per the manufacturers recommended testing pressures.				
	PPR Pipework -Cold & Hot Water				
A	50mm dia PPR Pipe	LM	100		
B	40mm -ditto-	LM	215		
C	32mm -ditto-	LM	220		
D	25mm -ditto-	LM	128		
E	20mm -ditto-	LM	166		
	Extra-over PPR pipework for the following:-				
	Bend/elbow				
F	50mm bend	No	41		
G	40mm bend	No	32		
H	32mm bend	No	32		
I	25mm bend	No	24		
J	25x1/2" dia male threaded 90o bend	No	36		
K	25x1/2"dia female threaded 90o bend	No	46		
	Tee				
L	20mm diameter equal tee	No	32		
M	25mm diameter equal tee	No	34		
N	25x1/2" female threaded tee	No	33		
O	25x1/2" male threaded tee	No	33		
P	32mm diameter equal tee	No	23		
Q	40mm diameter equal tee	No	27		
R	50mm diameter equal tee	No	23		
	Union				
S	20mm ditto	No	31		
T	25mm ditto	No	31		
U	32mm ditto	No	27		
V	40mm ditto	No	28		
W	50mm ditto	No	16		
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block **Total Carried Forward to Collection Page**				
			E/13		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Reducer				
A	25/20mm reducers	No	26		
B	32/25mm reducers	No	22		
C	40/32mm reducers	No	26		
D	50/32mm reducers	No	24		
	Gate Valve				
E	25mm dia "Peglers" gate valve	No	8		
F	32mm -ditto	No	5		
G	40mm -ditto	No	3		
H	50mm -ditto	No.	1		
	Flexible connector				
H	450mm flexible connector with chrome plated angle check valve size 15mm dia including unions and sockets to connect sanitary fittings to PP-R Pipework (To be part of Sanitary Fittings)	No.	20		
	-				
	Proposed (B-STEP) ,Kisumu Polytechnic – Administration Block Total Carried Forward To Collection Page				
			E/14		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No2: Internal Plumbing				
	Collection Page				
	Brought forward from Page E/13				
	Brought forward from Page E/14				
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block Total Carried Forward to Main Collection Page				
			E/15		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Foul Water Internal Drainage				
	Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. 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.				
	MuPVC and uPVC Waste and Soil pipework				
A	200mm mUPVC Pipe	LM	0		
B	150mm diameter heavy gauge grey mUPVC pipe	LM	96		
C	100mm diameter heavy gauge golden brown UPVC pipe	LM	240		
D	50mm diameter waste pipe	LM	190		
E	40mm diameter waste pipe	LM	210		
	Bend				
E	150mm diameter access bend	No.	25		
F	100mm diameter access bend	No.	41		
G	150mm diameter sweep bend	No.	26		
H	100mm diameter sweep bend	No.	36		
I	50mm diameter sweep bend	No.	38		
J	40mm diameter sweep bend	No.	45		
	Tee				
K	150mm diameter sweep tee	No.	21		
L	100mm diameter sweep tee	No.	23		
M	50mm diameter sweep tee	No.	45		
N	40mm diameter sweep tee	No.	48		
	Access Cap				
O	150mm diameter access cap	No.	7		
P	100mm diameter access cap	No.	35		
Q	50mm diameter access cap	No.	35		
R	40mm diameter access cap	No.	33		
	Boss Connector				
S	100 x 50mm diameter boss connector	No.	22		
T	50 x 40mm diameter boss connector	No.	22		
	Single Branch				
U	100mm diameter single branch	No.	15		
V	50mm diameter single branch	No.	18		
	WC Connector				
X	100mm diameter WC connector	No.	10		
	Trap				
Y	100 x 50mm diameter floor trap and grating	No.	18		
Z	600mm stainless steel linear shower drain	No.	2		
AA	50 x 50mm diameter U-shaped tubular trap	No.	26		
	Testing and Commissioning				
CC	Allow for testing and commissioning of the plumbing and drainage installations to the satisfaction of the Engineer.	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block **Total Carried Forward to Collection Page**				
			E/16		

	Fire Fighting Services				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Portable Fire Extinguisher				
A	Supply, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.				
	Water/Carbon Dioxide Gas Fire Extinguisher				
B	9 litres water/carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	0		
	Carbon Dioxide Gas Fire Extinguisher				
C	5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Dry Chemical Powder Fire Extinguisher				
D	9kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Automatic Dry Chemical Powder Fire Extinguisher				
E	10kg automatic dry chemical podwer fire extinguisher complete with pressure gauge, initial charge, glass bulb, sprinkler head and mounting base. The operating temperature of the bulb shall be 68°C. The unit shall be mounted on the concrete slab ceiling using purpose-made screws and to be as Germania, model GD 25 or equal and approved.	No	0		
F	Fire blanket made of cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm. It shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket to BS 1721.	No	1		
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block **Total Carried Forward to Collection Page**				
			E/17		

	RAIN WATER DRAINAGE				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Rain Water Drainage				
	Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Pipework work prices includes 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.				
	Pipe				
A	150mm diameter heavy gauge grey mUPVC down pipes	LM	128		
B	100mm diameter heavy gauge grey mUPVC down pipes	LM	260		
C	50mm diameter heavy gauge grey mUPVC down pipes	LM	60		
	Bend				
C	100mm diameter bend	No.	31		
D	10mm diameter 45deg. bend	No.	32		
	Tee				
E	100mm diameter tee	No.	10		
F	150mm diameter tee	No.	15		
	Others				
G	150mm diameter cast iron fulbora	No.	0		
	Working Drawings / As Built Drawings				
T	Allow a Sum for preparation of working draiwngs / As Built drawings & Equipment Manuals	Sum	1		
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block **Total Carried Forward to Collection Page**				
			E/18		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	<u>Collection Page</u>				
	Bill No.1 : Sanitary Fittings				
	Bill No.2 : Internal Plumbing				
	Bill No.3 : Foul Drainage				
	Bill No.4 : Portable Fire Extinguishers				
	Bill No.5: Rain Water Drainage				
	Proposed (B-STEP), Kisumu Polytechnic – Administration Block **Total Carried Forward to Main Collection Page**				

	TEACHING BLOCK				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Sanitary Fittings-Apartments				
	To supply and install the following Sanitary fittings including all the necessary joints to service overflow and waste pipes, jointings and motices, plugs, screws bolts and making good. Sanitary Fittings will be to Engineer's & Interior Designers' approval of the relevant samples				
	Water Closet				
A	Close Coupled WC with 'P'-trap complete with horizontal outlet to BS 3402 with dual flush button and heavy duty plastic seat and cover with heavy duty steel hinges. All to be as **" Twyford "** or equal an approved	No.	6		
B	Ditto but floor standing with concealed toilet flush valve	No.	0		
C	**Disabled Persons Water Closet and Wash Hand Basin Facility**				
	Wheel chair accessible W.C facility Comprising of the following:-	No.	1		
	i) Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow. The bowl shall be of size 375x560x420mm high. The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402 .The unit shall be complete with valveless cistern fittings including syphon, 15mm side inlet ball valve, 20mm side overflow, plastics flushbend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat(25mmhigh) and cover with chrome plated metal hinges, toilet roll holder, 600 x 600 x 6mm thick mirror and robe hook.				
	ii) Semi pedestal wall mounted W.H.B of size 600x500x545mm high with flexible connectors to waste and taps. The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 1/2'' Self Closing Tap,Pillar type, chrome plated waste with height adjustable trap, pedestal and wall fixing bolts.				
	iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate plate size 230x100 mm, 4No 600mm grab rails with covered wall plates. The set shall be as Twyfords DOC.M wheelchair accessible W.C. facility or approved equivalent.				
	Wash Hand Basin				
D	Countertop wash hand basin size 460 x330x430mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, Cobra single lever Mixer tap and heavy duty plastic bottle trap (32mm 'P' trap) with 75mm seal. All to be as **" Twyford "** or equal and approved.	No.	8		
E	Ditto but Wall hung Semi pedestal	No.	0		
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/19		

Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Urinals bowls				
A	Ceramic urinal bowl complete with 40mm heavy duty plastic bottle trap and 40mm diameter chrome plated outlet with grating firmly fixed on the wall with chrome plated screws. The fittings shall be as **" Twyford "** or equal and approved.	No.	3		
	Urinal Bowl Divisions				
B	Ceramic urinal bowl divisions' separating the above described urinal bowls fixed firmly on the wall. The fittings shall be as **" Twyford "**or equal and approved.	No.	3		
	Urinal Flush Valve				
C	Concealed Delay Action Urinal Flush Valve **" Twyford "** or equal and approved.	No.	3		
	Robe Hook				
D	Aluminium Robe hook with door stopper in Matte Black Colour to be mounted by concealed screws to wall wedges. To be as **"Duravit"** accessories or equal and approved.	No.	6		
	Towel Ring				
E	**" Twyford "** Towel ring size 225mm dia with SS dome headed screws.	No.	0		
	Toilet Roll Holder				
F	Stainless steel toilet roll holder as **" Twyford "** or equal and approved.	No.	6		
	Toilet Brush Holder				
G	Toilet brush holder as **" Plumber"** or approved equivalent.	No.	6		
	Paper Towel dispenser				
H	Wall-mounted manual paper towel dispenser as **"Mediclinics"** or equal and approved.	No.	2		
	Mirror				
I	6mm thick polished plate glass silver backed mirror with bevelled edges, size:600mm dia ,Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	No.	8		
	Arabic Shower				
J	**'Plumber '' or equal** Arabic Shower complete with wall hook	No	0		
	Hand Drier				
K	Automatic hand drier in white colour, operating on an infra-red automatic sensing system with heating element safety cut-out complete with a 30 seconds safety timer, plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 1.5kW and performance flow rate of 135cfm (4.22m³/min) and to be of size 305x225x154mm deep It shall have a noise level below 57 dBA at 2m. It shall be as **Medclinics** or approved equivalent.	No.	0		
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/20		

Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Shower Fitting				
A	Shower fitting consisting of the concealed 4 way diverter single lever shower mixer or approved equivalent and 200mm diameter swivel/ adjustable rain shower rose , shower arm and other necessary fittings and accessories. All to be as Cobra or equal and approved	No	0		
	Towel Rail				
B	Stainless Steel towel rail 20mm diameter by 1000mm long with the rail and brackets as one piece, all as **" Plumber "** or equal and approved.	No.	0		
	Soap and Sponge Tray				
C	Stainless steel soap and sponge tray in approved colour. As **" Plumber"** or equal and approved.	No	0		
	Kichen sink				
D	Double bowl sink INSET size:860x 420 x200mm complete with Single Lever Cobra mixer tap swivel , plastic bottle trap, Pop-up & waste plug	No	0		
E	Ditto but double bowl,double drain Size:1500x490x200mm deep	No	0		
	Cleaners Sink				
F	**"Plumber"** or equal stainless steel cleaners sink size 500x480x280mm INSET to be fixed on concrete counter to inclusive of Cobra single lever tap grid waste fitting pad, plastic bottle trap.	No	1		
	Instant Shower Heater				
G	**'Lorenzetti''** Instant shower Heater as **"Lorenzetti"** or equal and approved.	No.	0		
	Instant Heater -5L				
H	**'Lorenzetti ''** under sink instant heater complete	No.	0		
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/21		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	<u>Bill No1: SANITARY APPLIANCES</u>				
	<u>Collection Page</u>				
	Brought forward from Page E/19				
	Brought forward from Page E/20				
	Brought forward from Page E/21				
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Main Collection Page**				
			E/22		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Internal Plumbing				
	Supply and install Polypropylene (PPR) pipes PN20, tubing and fittings as described and shown on the drawings. The pipes shall be produced as per SDR 11 and shall meet or exceed the requirements as of ASTM D 2846, current European standards for PPR installations and to the Engineers approval. All joints shall be assembled employing solvent cements that meet or exceed the requirements of ASTM F442 and ASTM F441. Rates must allow for all Metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints, support raceways, isolating sheaths, elastic materials, expansion arms and bends, crossovers, 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. The pipes will be pressure tested before the plastering of wall commences and as per the manufacturers recommended testing pressures.				
	PPR Pipework -Cold & Hot Water				
A	50mm dia PPR Pipe	LM	100		
B	40mm -ditto-	LM	120		
C	32mm -ditto-	LM	110		
D	25mm -ditto-	LM	115		
E	20mm -ditto-	LM	118		
	Extra-over PPR pipework for the following: -				
	Bend/elbow				
F	50mm bend	No	48		
G	40mm bend	No	34		
H	32mm bend	No	35		
I	25mm bend	No	31		
J	25x1/2" dia male threaded 90o bend	No	26		
K	25x1/2"dia female threaded 90o bend	No	21		
	Tee				
L	20mm diameter equal tee	No	26		
M	25mm diameter equal tee	No	25		
N	25x1/2" female threaded tee	No	21		
O	25x1/2" male threaded tee	No	22		
P	32mm diameter equal tee	No	23		
Q	40mm diameter equal tee	No	27		
R	50mm diameter equal tee	No	23		
	Union				
S	20mm ditto	No	22		
T	25mm ditto	No	21		
U	32mm ditto	No	27		
V	40mm ditto	No	28		
W	50mm ditto	No	26		
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/23		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Reducer				
A	25/20mm reducers	No	26		
B	32/25mm reducers	No	2		
C	40/32mm reducers	No	26		
D	50/32mm reducers	No	24		
	Gate Valve				
E	25mm dia "Peglers" gate valve	No	8		
F	32mm -ditto	No	10		
G	40mm -ditto	No	6		
H	50mm -ditto	No.	6		
	Flexible connector				
H	450mm flexible connector with chrome plated angle check valve size 15mm dia including unions and sockets to connect sanitary fittings to PP-R Pipework (To be part of Sanitary Fittings)	No.	16		
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/24		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No2: Internal Plumbing				
	Collection Page				
	Brought forward from Page E/23				
	Brought forward from Page E/24				
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/25		

Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Foul Water Internal Drainage				
	Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. 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.				
	MuPVC and uPVC Waste and Soil pipework				
A	200mm mUPVC Pipe	LM	0		
B	150mm diameter heavy gauge grey mUPVC pipe	LM	78		
C	100mm diameter heavy gauge golden brown UPVC pipe	LM	243		
D	50mm diameter waste pipe	LM	190		
E	40mm diameter waste pipe	LM	266		
	Bend				
E	150mm diameter access bend	No.	25		
F	100mm diameter access bend	No.	41		
G	150mm diameter sweep bend	No.	26		
H	100mm diameter sweep bend	No.	26		
I	50mm diameter sweep bend	No.	52		
J	40mm diameter sweep bend	No.	62		
	Tee				
K	150mm diameter sweep tee	No.	1		
L	100mm diameter sweep tee	No.	23		
M	50mm diameter sweep tee	No.	45		
N	40mm diameter sweep tee	No.	49		
	Access Cap				
O	150mm diameter access cap	No.	2		
P	100mm diameter access cap	No.	24		
Q	50mm diameter access cap	No.	42		
R	40mm diameter access cap	No.	43		
	Boss Connector				
S	100 x 50mm diameter boss connector	No.	21		
T	50 x 40mm diameter boss connector	No.	22		
	Single Branch				
U	100mm diameter single branch	No.	21		
V	50mm diameter single branch	No.	15		
	WC Connector				
X	100mm diameter WC connector	No.	7		
	Trap				
Y	100 x 50mm diameter floor trap and grating	No.	5		
Z	600mm stainless steel linear shower drain	No.	1		
AA	50 x 50mm diameter U-shaped tubular trap	No.	6		
	Testing and Commissioning				
BB	Allow for testing and commissioning of the plumbing and drainage installations to the satisfaction of the Engineer.	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic – Teaching Block **Total Carried Forward to Collection Page**				
			E/26		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Portable Fire Extinguisher				
A	Supply, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.				
	Water/Carbon Dioxide Gas Fire Extinguisher				
B	9 litres water/carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Carbon Dioxide Gas Fire Extinguisher				
C	5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	2		
	Dry Chemical Powder Fire Extinguisher				
D	9kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Automatic Dry Chemical Powder Fire Extinguisher				
E	10kg automatic dry chemical podwer fire extinguisher complete with pressure gauge, initial charge, glass bulb, sprinkler head and mounting base. The operating temperature of the bulb shall be 68°C. The unit shall be mounted on the concrete slab ceiling using purpose-made screws and to be as Germania, model GD 25 or equal and approved.	No	0		
F	Fire blanket made of cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm. It shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket to BS 1721.	No	0		
	Proposed (B-STEP) ,Kisumu Polytechnic – Teaching Block **Total Carried Forward To Collection Page**				
			E/27		

	RAIN WATER DRAINAGE				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Rain Water Drainage				
	Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Pipework work prices includes 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.				
	Pipe				
A	150mm diameter heavy gauge grey mUPVC down pipes	LM	126		
B	100mm diameter heavy gauge grey mUPVC down pipes	LM	260		
C	50mm diameter heavy gauge grey mUPVC down pipes	LM	112		
	Bend				
C	100mm diameter bend	No.	34		
D	10mm diameter 45deg. bend	No.	36		
	Tee				
E	100mm diameter tee	No.	10		
F	150mm diameter tee	No.	12		
	Others				
G	150mm diameter cast iron fulbora	No.	2		
	Working Drawings / As Built Drawings				
T	Allow a Sum for preparation of working draiwngs / As Built drawings & Equipment Manuals	Sum	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Teaching Block **Total Carried Forward To Collection Page**				
			E/28		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	Collection Page				
	Bill No.1 : Sanitary Fittings				
	Bill No.2 : Internal Plumbing				
	Bill No.3 : Foul Drainage				
	Bill No.4 : Portable Fire Extinguishers				
	Bill No.5 : Rain Water Drainage				
	Proposed (B-STEP) ,Kisumu Polytechnic – Teaching Block **Total Carried Forward To Main Collection Page**				
			E/29		

	RESTAURANT				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Sanitary Fittings-Apartments				
	To supply and install the following Sanitary fittings including all the necessary joints to service overflow and waste pipes, jointings and motices, plugs, screws bolts and making good.Sanitary Fittings will be to Engineer's & Interior Designers' approval of the relevant samples				
	Water Closet				
A	Close Coupled WC with 'P'-trap complete with horizontal outlet to BS 3402 with dual flush button and heavy duty plastic seat and cover with heavy duty steel hinges. All to be as **" Twyford "** or equal an approved	No.	5		
B	Ditto but floor standing with concealed toilet flush valve	No.	2		
C	**Disabled Persons Water Closet and Wash Hand Basin Facility**				
	Wheel chair accessible W.C facility Comprising of the following:-	No.	2		
	i) Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow. The bowl shall be of size 375x560x420mm high. The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402 .The unit shall be complete with valveless cistern fittings including syphon, 15mm side inlet ball valve, 20mm side overflow, plastics flushbend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat(25mmhigh) and cover with chrome plated metal hinges, toilet roll holder, 600 x 600 x 6mm thick mirror and robe hook.				
	ii) Semi pedestal wall mounted W.H.B of size 600x500x545mm high with flexible connectors to waste and taps. The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 1/2'' Self Closing Tap,Pillar type, chrome plated waste with height adjustable trap, pedestal and wall fixing bolts.				
	iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate plate size 230x100 mm, 4No 600mm grab rails with covered wall plates. The set shall be as Twyfords DOC.M wheelchair accessible W.C. facility or approved equivalent.				
	Wash Hand Basin				
D	Countertop wash hand basin size 460 x330x430mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, Cobra single lever Mixer tap and heavy duty plastic bottle trap (32mm 'P' trap) with 75mm seal. All to be as **" Twyford "** or equal and approved.	No.	6		
E	Ditto but Wall hung Semi pedestal	No.	10		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/30		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Urinals bowls				
A	Ceramic urinal bowl complete with 40mm heavy duty plastic bottle trap and 40mm diameter chrome plated outlet with grating firmly fixed on the wall with chrome plated screws. The fittings shall be as **" Twyford "** or equal and approved.	No.	3		
	Urinal Bowl Divisions				
B	Ceramic urinal bowl divisions' separating the above described urinal bowls fixed firmly on the wall. The fittings shall be as **" Twyford "**or equal and approved.	No.	3		
	Urinal Flush Valve				
C	Concealed Delay Action Urinal Flush Valve **" Twyford "** or equal and approved.	No.	3		
	Robe Hook				
D	Aluminium Robe hook with door stopper in Matte Black Colour to be mounted by concealed screws to wall wedges. To be as **" Plumber "** accessories or equal and approved.	No.	9		
	Towel Ring				
E	**"Plumber "** Towel ring size 225mm dia with SS dome headed screws.	No.	7		
	Toilet Roll Holder				
F	Stainless steel toilet roll holder as **"Plumber "** or equal and approved.	No.	7		
	Toilet Brush Holder				
G	Toilet brush holder as **" Plumber "** or approved equivalent.	No.	7		
	Paper Towel dispenser				
H	Wall-mounted manual paper towel dispenser as **"Mediclinics"** or equal and approved.	No.	4		
	Mirror				
I	6mm thick polished plate glass silver backed mirror with bevelled edges, size:600mm dia ,Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	No.	8		
	Arabic Shower				
J	**' Plumber '' or equal** Arabic Shower complete with wall hook	No	0		
	Hand Drier				
K	Automatic hand drier in white colour, operating on an infra-red automatic sensing system with heating element safety cut-out complete with a 30 seconds safety timer, plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 1.5kW and performance flow rate of 135cfm (4.22m³/min) and to be of size 305x225x154mm deep It shall have a noise level below 57 dBA at 2m. It shall be as **Medclinics** or approved equivalent.	No.	0		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/31		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Shower Fitting				
A	Shower fitting consisting of the concealed 4 way diverter single lever shower mixer or approved equivalent and 200mm diameter swivel/ adjustable rain shower rose , shower arm and other necessary fittings and accessories. All to be as Cobra or equal and approved	No	2		
	Towel Rail				
B	Stainless Steel towel rail 20mm diameter by 1000mm long with the rail and brackets as one piece, all as **" Plumber "** or equal and approved.	No.	2		
	Soap and Sponge Tray				
C	Stainless steel soap and sponge tray in approved colour. As **" Plumber "** or equal and approved.	No	2		
	Kichen sink				
D	Double bowl sink INSET size:860x 420 x200mm complete with Single Lever Cobra mixer tap swivel , plastic bottle trap, Pop-up & waste plug	No	5		
E	Ditto but double bowl,double drain Size:1500x490x200mm deep	No	2		
	Cleaners Sink				
F	**"Plumber"** or equal stainless steel cleaners sink size 500x480x280mm INSET to be fixed on concrete counter to inclusive of Cobra single lever tap grid waste fitting pad, plastic bottle trap.	No	0		
	Instant Shower Heater				
G	**'Lorenzetti''** Instant shower Heater as **"Lorenzetti"** or equal and approved.	No.	0		
	Instant Heater -5L				
H	**'Lorenzetti ''** under sink instant heater complete	No.	2		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/32		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No1: SANITARY APPLIANCES				
	Collection Page				
	Brought forward from Page E/30				
	Brought forward from Page E/31				
	Brought forward from Page E/32				
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Main Collection Page**				
			E/33		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Internal Plumbing				
	Supply and install Polypropylene (PPR) pipes PN20, tubing and fittings as described and shown on the drawings. The pipes shall be produced as per SDR 11 and shall meet or exceed the requirements as of ASTM D 2846, current European standards for PPR installations and to the Engineers approval. All joints shall be assembled employing solvent cements that meet or exceed the requirements of ASTM F442 and ASTM F441. Rates must allow for all Metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints, support raceways, isolating sheaths, elastic materials, expansion arms and bends, crossovers, 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. The pipes will be pressure tested before the plastering of wall commences and as per the manufacturers recommended testing pressures.				
	PPR Pipework -Cold & Hot Water				
A	50mm dia PPR Pipe	LM	120		
B	40mm -ditto-	LM	180		
C	32mm -ditto-	LM	210		
D	25mm -ditto-	LM	222		
E	20mm -ditto-	LM	218		
	Extra-over PPR pipework for the following:-				
	Bend/elbow				
F	50mm bend	No	74		
G	40mm bend	No	54		
H	32mm bend	No	33		
I	25mm bend	No	31		
J	25x1/2" dia male threaded 90o bend	No	36		
K	25x1/2"dia female threaded 90o bend	No	31		
	Tee				
L	20mm diameter equal tee	No	36		
M	25mm diameter equal tee	No	34		
N	25x1/2" female threaded tee	No	31		
O	25x1/2" male threaded tee	No	32		
P	32mm diameter equal tee	No	33		
Q	40mm diameter equal tee	No	31		
R	50mm diameter equal tee	No	33		
	Union				
S	20mm ditto	No	32		
T	25mm ditto	No	31		
U	32mm ditto	No	34		
V	40mm ditto	No	38		
W	50mm ditto	No	16		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/34		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Reducer				
A	25/20mm reducers	No	36		
B	32/25mm reducers	No	33		
C	40/32mm reducers	No	36		
D	50/32mm reducers	No	31		
	Gate Valve				
E	25mm dia "Peglers" gate valve	No	8		
F	32mm -ditto	No	10		
G	40mm -ditto	No	4		
H	50mm -ditto	No.	2		
	Flexible connector				
H	450mm flexible connector with chrome plated angle check valve size 15mm dia including unions and sockets to connect sanitary fittings to PP-R Pipework (To be part of Sanitary Fittings)	No.	24		
	Solar Water Heating System				
I	**Supply & Install** 300L VacRod Solar Hot Water Heating System with double layered borosilicate glass vacuum tube with clear outer layer and an inner layer specially coated for maximum solar irradiation absorption. Storage tank comprising heavy duty stainless steel SU316 inner cylinder with external insulated painted steel casing.Aluminium header manifold for heat transfer & anodised aluminum frame as"**Dayliff Ultrasun UVR300" or equal approved.**	No.	2		
J	Connection piping that includes an incoming non-return valve, pressure release valve rated at 6bar, and drain cock	No.	2		
K	Galvanized mounting frame for slant roof installations that ensures high durability in all weather conditions	No.	2		
L	Allow for testing and commissioning for all solar heating systems	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/35		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	<u>Bill No2: Internal Plumbing</u>				
	<u>Collection Page</u>				
	Brought forward from Page E/34				
	Brought forward from Page E/35				
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/36		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Foul Water Internal Drainage				
	Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. 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.				
	MuPVC and uPVC Waste and Soil pipework				
A	200mm mUPVC Pipe	LM	0		
B	150mm diameter heavy gauge grey mUPVC pipe	LM	120		
C	100mm diameter heavy gauge golden brown UPVC pipe	LM	186		
D	50mm diameter waste pipe	LM	134		
E	40mm diameter waste pipe	LM	126		
	Bend				
E	150mm diameter access bend	No.	2		
F	100mm diameter access bend	No.	22		
G	150mm diameter sweep bend	No.	12		
H	100mm diameter sweep bend	No.	33		
I	50mm diameter sweep bend	No.	46		
J	40mm diameter sweep bend	No.	54		
	Tee				
K	150mm diameter sweep tee	No.	0		
L	100mm diameter sweep tee	No.	34		
M	50mm diameter sweep tee	No.	41		
N	40mm diameter sweep tee	No.	68		
	Access Cap				
O	150mm diameter access cap	No.	27		
P	100mm diameter access cap	No.	36		
Q	50mm diameter access cap	No.	32		
R	40mm diameter access cap	No.	43		
	Boss Connector				
S	100 x 50mm diameter boss connector	No.	21		
T	50 x 40mm diameter boss connector	No.	21		
	Single Branch				
U	100mm diameter single branch	No.	18		
V	50mm diameter single branch	No.	15		
	WC Connector				
X	100mm diameter WC connector	No.	12		
	Trap				
Y	100 x 50mm diameter floor trap and grating	No.	5		
Z	600mm stainless steel linear shower drain	No.	4		
AA	50 x 50mm diameter U-shaped tubular trap	No.	6		
	Grease trap				
BB	Stainless steel 3No.chambered commercial Grease Trap complete with all necessary accessories and connections.	No	1		
	Testing and Commissioning				
CC	Allow for testing and commissioning of the plumbing and drainage installations to the satisfaction of the Engineer.	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/37		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Portable Fire Extinguisher				
A	Supply, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.				
	Carbon Dioxide Gas Fire Extinguisher				
B	9 litres Carbon dioxide gas portable fire extinguisher completes with pressure gauge, initial charge and mounting brackets.	No	4		
	Carbon Dioxide Gas Fire Extinguisher				
C	5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Dry Chemical Powder Fire Extinguisher				
D	9kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Automatic Dry Chemical Powder Fire Extinguisher				-
E	10kg automatic dry chemical podwer fire extinguisher complete with pressure gauge, initial charge, glass bulb, sprinkler head and mounting base. The operating temperature of the bulb shall be 68°C. The unit shall be mounted on the concrete slab ceiling using purpose-made screws and to be as Germania, model GD 25 or equal and approved.	No	2		
F	Fire blanket made of cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm. It shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket to BS 1721.	No	4		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/38		

	RAIN WATER DRAINAGE				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Rain Water Drainage				
	Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Pipework work prices includes 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.				
	Pipe				
A	150mm diameter heavy gauge grey mUPVC down pipes	LM	64		
B	100mm diameter heavy gauge grey mUPVC down pipes	LM	126		
C	50mm diameter heavy gauge grey mUPVC down pipes	LM	36		
	Bend				
D	100mm diameter bend	No.	12		
E	100mm diameter 45deg. bend	No.	10		
	Tee				
F	100mm diameter tee	No.	4		
G	150mm diameter tee	No.	2		
	Others				
H	150mm diameter cast iron fulbora	No.	2		
	Working Drawings / As Built Drawings				
I	Allow a Sum for preparation of working draiwngs / As Built drawings & Equipment Manuals	Sum	1		
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Collection Page**				
			E/39		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	<u>Collection Page</u>				
	Bill No.1 : Sanitary Fittings				
	Bill No.2 : Internal Plumbing				
	Bill No.3 : Foul Drainage				
	Bill No.4 : Portable Fire Extinguishers				
	Bill No.5 : Rain Water Drainage				
	Proposed (B-STEP), Kisumu Polytechnic – Restaurant **Total Carried Forward to Main Collection Page**				
			E/39		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	AQUA CENTRE				
	Sanitary Fittings-Apartments				
	To supply and install the following Sanitary fittings including all the necessary joints to service overflow and waste pipes, jointings and motices, plugs, screws bolts and making good. Sanitary Fittings will be to Engineer's & Interior Designers' approval of the relevant samples				
	Water Closet				
A	Close Coupled WC with 'P'-trap complete with horizontal outlet to BS 3402 with dual flush button and heavy duty plastic seat and cover with heavy duty steel hinges. All to be as **Twyford** or equal an approved	No.	4		
B	Ditto but floor standing with concealed toilet flush valve	No.	4		
C	**Disabled Persons Water Closet and Wash Hand Basin Facility**				
	Wheel chair accessible W.C facility Comprising of the following:-	No.	2		
	i) Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow. The bowl shall be of size 375x560x420mm high. The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402 .The unit shall be complete with valveless cistern fittings including syphon, 15mm side inlet ball valve, 20mm side overflow, plastics flushbend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat(25mmhigh) and cover with chrome plated metal hinges, toilet roll holder, 600 x 600 x 6mm thick mirror and robe hook.				-
	ii) Semi pedestal wall mounted W.H.B of size 600x500x545mm high with flexible connectors to waste and taps. The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 1/2'' Self Closing Tap,Pillar type, chrome plated waste with height adjustable trap, pedestal and wall fixing bolts.				-
	iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate plate size 230x100 mm, 4No 600mm grab rails with covered wall plates. The set shall be as Twyfords DOC.M wheelchair accessible W.C. facility or approved equivalent.				-
	Wash Hand Basin				-
D	Countertop wash hand basin size 460 x330x430mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, Cobra single lever Mixer tap and heavy duty plastic bottle trap (32mm 'P' trap) with 75mm seal. All to be as **"Twyford "** or equal and approved.	No.	10		
E	Ditto but Wall hung Semi pedestal	No.	2		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/40		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Urinals bowls				
A	Ceramic urinal bowl complete with 40mm heavy duty plastic bottle trap and 40mm diameter chrome plated outlet with grating firmly fixed on the wall with chrome plated screws. The fittings shall be as **"Twford"** or equal and approved.	No.	6		
	Urinal Bowl Divisions				
B	Ceramic urinal bowl divisions' separating the above described urinal bowls fixed firmly on the wall. The fittings shall be as **" Twyford "**or equal and approved.	No.	6		
	Urinal Flush Valve				
C	Concealed Delay Action Urinal Flush Valve **" Twyford "** or equal and approved.	No.	6		
	Robe Hook				
D	Aluminium Robe hook with door stopper in Matte Black Color to be mounted by concealed screws to wall wedges. To be as **" Twyford "** accessories or equal and approved.	No.	10		
	Towel Ring				
E	**"Twyford "** Towel ring size 225mm dia with SS dome headed screws.	No.	10		
	Toilet Roll Holder				
F	Stainless steel toilet roll holder as **" Twyford "** or equal and approved.	No.	8		
	Toilet Brush Holder				
G	Toilet brush holder as **"Duravit"** or approved equivalent.	No.	8		
	Paper Towel dispenser				
H	Wall-mounted manual paper towel dispenser as **"Mediclinics"** or equal and approved.	No.	4		
	Mirror				
I	6mm thick polished plate glass silver backed mirror with bevelled edges, size:600mm dia ,Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	No.	12		
	Arabic Shower				
J	**' Twyford '' or equal** Arabic Shower complete with wall hook	No	0		
	Hand Drier				
K	Automatic hand drier in white colour, operating on an infra-red automatic sensing system with heating element safety cut-out complete with a 30 seconds safety timer, plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 1.5kW and performance flow rate of 135cfm (4.22m^3/min) and to be of size 305x225x154mm deep It shall have a noise level below 57 dBA at 2m. It shall be as **Medclinics** or approved equivalent.	No.	0		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/41		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Shower Fitting				
A	Shower fitting consisting of the concealed 4 way diverter single lever shower mixer or approved equivalent and 200mm diameter swivel/ adjustable rain shower rose , shower arm and other necessary fittings and accessories. All to be as Cobra or equal and approved	No	**0**		
	Towel Rail				-
B	Stainless Steel towel rail 20mm diameter by 1000mm long with the rail and brackets as one piece, all as "Duravit" or equal and approved.	No.	**0**		
	Soap and Sponge Tray				-
C	Stainless steel soap and sponge tray in approved colour. As "Duravit" or equal and approved.	No	**0**		
	Kichen sink				
D	Double bowl sink INSET size:860x 420 x200mm complete with Single Lever Cobra mixer tap swivel , plastic bottle trap, Pop-up & waste plug	No	**0**		
E	Ditto but double bowl,double drain Size:1500x490x200mm deep	No	**0**		
	Cleaners Sink				-
F	“Duravit” or equal stainless steel cleaners sink size 500x480x280mm INSET to be fixed on concrete counter to inclusive of Cobra single lever tap grid waste fitting pad, plastic bottle trap.	No	**0**		
	Instant Shower Heater				-
G	'Lorenzetti'' Instant shower Heater as "Lorenzetti" or equal and approved.	No.	**0**		
	Instant Heater -5L				
H	'Lorenzetti '' under sink instant heater complete	No.	**4**		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/42		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No1: SANITARY APPLIANCES				
	Collection Page				
	Brought forward from Page E/40				
	Brought forward from Page E/41				
	Brought forward from Page E/42				
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Main Collection Page**				
			E/43		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Internal Plumbing				
	Supply and install Polypropylene (PPR) pipes PN20, tubing and fittings as described and shown on the drawings. The pipes shall be produced as per SDR 11 and shall meet or exceed the requirements as of ASTM D 2846, current European standards for PPR installations and to the Engineers approval. All joints shall be assembled employing solvent cements that meet or exceed the requirements of ASTM F442 and ASTM F441. Rates must allow for all Metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints, support raceways, isolating sheaths, elastic materials, expansion arms and bends, crossovers, 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. The pipes will be pressure tested before the plastering of wall commences and as per the manufacturers recommended testing pressures.				
	PPR Pipework -Cold & Hot Water				
A	50mm dia PPR Pipe	LM	48		
B	40mm -ditto-	LM	66		
C	32mm -ditto-	LM	220		
D	25mm -ditto-	LM	214		
E	20mm -ditto-	LM	128		
	Extra-over PPR pipework for the following:-				-
	Bend/elbow				-
F	50mm bend	No	18		
G	40mm bend	No	31		
H	32mm bend	No	35		
I	25mm bend	No	31		
J	25x1/2" dia male threaded 90o bend	No	36		
K	25x1/2"dia female threaded 90o bend	No	31		
	Tee				-
L	20mm diameter equal tee	No	36		
M	25mm diameter equal tee	No	34		
N	25x1/2" female threaded tee	No	31		
O	25x1/2" male threaded tee	No	32		
P	32mm diameter equal tee	No	33		
Q	40mm diameter equal tee	No	37		
R	50mm diameter equal tee	No	33		
	Union				-
S	20mm ditto	No	33		
T	25mm ditto	No	32		
U	32mm ditto	No	37		
V	40mm ditto	No	38		
W	50mm ditto	No	16		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/44		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Reducer				
A	25/20mm reducers	No	36		
B	32/25mm reducers	No	33		
C	40/32mm reducers	No	36		
D	50/32mm reducers	No	34		
	Gate Valve				
E	25mm dia "Peglers" gate valve	No	7		
F	32mm -ditto	No	5		
G	40mm -ditto	No	3		
H	50mm -ditto	No.	2		
	Flexible connector				
H	450mm flexible connector with chrome plated angle check valve size 15mm dia including unions and sockets to connect sanitary fittings to PP-R Pipework (To be part of Sanitary Fittings)	No.	25		
	-				
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/45		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	<u>Bill No2: Internal Plumbing</u>				
	<u>Collection Page</u>				
	Brought forward from Page E/44				
	Brought forward from Page E/45				
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Main Collection Page**				
			E/46		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Foul Water Internal Drainage				
	Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. 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.				
	MuPVC and uPVC Waste and Soil pipework				
A	200mm mUPVC Pipe	LM	0		
B	150mm diameter heavy gauge grey mUPVC pipe	LM	100		
C	100mm diameter heavy gauge golden brown UPVC pipe	LM	260		
D	50mm diameter waste pipe	LM	148		
E	40mm diameter waste pipe	LM	115		
	Bend				
E	150mm diameter access bend	No.	2		
F	100mm diameter access bend	No.	36		
G	150mm diameter sweep bend	No.	11		
H	100mm diameter sweep bend	No.	41		
I	50mm diameter sweep bend	No.	36		
J	40mm diameter sweep bend	No.	56		
	Tee				
K	150mm diameter sweep tee	No.	21		
L	100mm diameter sweep tee	No.	22		
M	50mm diameter sweep tee	No.	40		
N	40mm diameter sweep tee	No.	49		
	Access Cap				
O	150mm diameter access cap	No.	17		
P	100mm diameter access cap	No.	14		
Q	50mm diameter access cap	No.	12		
R	40mm diameter access cap	No.	13		
	Boss Connector				
S	100 x 50mm diameter boss connector	No.	12		
T	50 x 40mm diameter boss connector	No.	11		
	Single Branch				
U	100mm diameter single branch	No.	18		
V	50mm diameter single branch	No.	15		
	WC Connector				
X	100mm diameter WC connector	No.	10		
	Trap				
Y	100 x 50mm diameter floor trap and grating	No.	5		
Z	600mm stainless steel linear shower drain	No.	0		
AA	50 x 50mm diameter U-shaped tubular trap	No.	6		
	Testing and Commissioning				
BB	Allow for testing and commissioning of the plumbing and drainage installations to the satisfaction of the Engineer.	Item	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/47		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Portable Fire Extinguisher				
A	Supply, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.				
	Water/Carbon Dioxide Gas Fire Extinguisher				
B	9 litres water/carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	2		
	Carbon Dioxide Gas Fire Extinguisher				
C	5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	2		
	Dry Chemical Powder Fire Extinguisher				
D	9kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	2		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/48		

	RAIN WATER DRAINAGE				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Rain Water Drainage				
	Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Pipework work prices includes 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.				
	Pipe				
A	150mm diameter heavy gauge grey mUPVC down pipes	LM	54		
B	100mm diameter heavy gauge grey mUPVC down pipes	LM	126		
C	50mm diameter heavy gauge grey mUPVC down pipes	LM	24		
	Bend				
C	100mm diameter bend	No.	15		
D	10mm diameter 45deg. bend	No.	16		
	Tee				
E	100mm diameter tee	No.	5		
F	150mm diameter tee	No.	4		
	Others				
G	150mm diameter cast iron fulbora	No.	2		
	Working Drawings / As Built Drawings				
T	Allow a Sum for preparation of working draiwngs / As Built drawings & Equipment Manuals	Sum	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Collection Page**				
			E/49		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	Collection Page – Aqua Centre				
	Bill No.1 : Sanitary Fittings				
	Bill No.2 : Internal Plumbing				
	Bill No.3 : Foul Drainage				
	Bill No.4 : Portable Fire Extinguishers				
	Bill No.5 : Rain Water Drainage				
	Proposed (B-STEP) ,Kisumu Polytechnic – Aqua Centre **Total Carried Forward To Summary Page**				
			E/50		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Sanitary Fittings-Apartments				
	WORKSHOP AND GATE HOUSE				
	To supply and install the following Sanitary fittings including all the necessary joints to service overflow and waste pipes, jointings and motices, plugs, screws bolts and making good. Sanitary Fittings will be to Engineer's & Interior Designers' approval of the relevant samples				
	Water Closet				
A	Close Coupled WC with 'P'-trap complete with horizontal outlet to BS 3402 with dual flush button and heavy duty plastic seat and cover with heavy duty steel hinges. All to be as **" Twyford "** or equal an approved	No.	5		
B	Ditto but floor standing with concealed toilet flush valve	No.	0		
C	**Disabled Persons Water Closet and Wash Hand Basin Facility**				
	Wheel chair accessible W.C facility Comprising of the following:-	No.	2		
	i) Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow. The bowl shall be of size 375x560x420mm high. The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402 .The unit shall be complete with valveless cistern fittings including syphon, 15mm side inlet ball valve, 20mm side overflow, plastics flushbend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat(25mmhigh) and cover with chrome plated metal hinges, toilet roll holder, 600 x 600 x 6mm thick mirror and robe hook.				
	ii) Semi pedestal wall mounted W.H.B of size 600x500x545mm high with flexible connectors to waste and taps. The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 1/2'' Self Closing Tap,Pillar type, chrome plated waste with height adjustable trap, pedestal and wall fixing bolts.				
	iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate size 230x100 mm, 4No 600mm grab rails with covered wall plates. The set shall be as Twyfords DOC.M wheelchair accessible W.C. facility or approved equivalent.				
	Wash Hand Basin				
D	Countertop wash hand basin size 460 x330x430mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, Cobra single lever Mixer tap and heavy duty plastic bottle trap (32mm 'P' trap) with 75mm seal. All to be as **" Twyford "** or equal and approved.	No.	0		
E	Ditto but Wall hung Semi pedestal	No.	5		
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House Total Carried Forward To Collection Page				
			E/51		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Urinals bowls				
A	Ceramic urinal bowl complete with 40mm heavy duty plastic bottle trap and 40mm diameter chrome plated outlet with grating firmly fixed on the wall with chrome plated screws. The fittings shall be as **" Twyford "** or equal and approved.	No.	0		
	Urinal Bowl Divisions				
B	Ceramic urinal bowl divisions' separating the above described urinal bowls fixed firmly on the wall. The fittings shall be as **" Twyford "**or equal and approved.	No.	0		
	Urinal Flush Valve				
C	Concealed Delay Action Urinal Flush Valve **" Twyford "** or equal and approved.	No.	0		
	Robe Hook				
D	Aluminium Robe hook with door stopper in Matte Black Colour to be mounted by concealed screws to wall wedges. To be as **" Twyford "** accessories or equal and approved.	No.	5		
	Towel Ring				
E	**" Twyford "** Towel ring size 225mm dia with SS dome headed screws.	No.	0		
	Toilet Roll Holder				
F	Stainless steel toilet roll holder as **" Twyford "** or equal and approved.	No.	5		
	Toilet Brush Holder				
G	Toilet brush holder as **" Twyford "** or approved equivalent.	No.	5		
	Paper Towel dispenser				
H	Wall-mounted manual paper towel dispenser as **"Mediclinics"** or equal and approved.	No.	3		
	Mirror				
I	6mm thick polished plate glass silver backed mirror with bevelled edges, size:600mm dia ,Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	No.	5		
	Arabic Shower				
J	**'Twyford '' or equal** Arabic Shower complete with wall hook	No	0		
	Hand Drier				
K	Automatic hand drier in white colour, operating on an infra-red automatic sensing system with heating element safety cut-out complete with a 30 seconds safety timer, plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 1.5kW and performance flow rate of 135cfm (4.22m^3/min) and to be of size 305x225x154mm deep It shall have a noise level below 57 dBA at 2m. It shall be as **Medclinics** or approved equivalent.	No.	0		
			E/52		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Shower Fitting				
A	Shower fitting consisting of the concealed 4 way diverter single lever shower mixer or approved equivalent and 200mm diameter swivel/ adjustable rain shower rose , shower arm and other necessary fittings and accessories. All to be as Cobra or equal and approved	No	**1**		
	Towel Rail				
B	Stainless Steel towel rail 20mm diameter by 1000mm long with the rail and brackets as one piece, all as "Duravit" or equal and approved.	No.	**1**		
	Soap and Sponge Tray				
C	Stainless steel soap and sponge tray in approved colour. As "Duravit" or equal and approved.	No	**1**		
	Kitchen sink				
D	Double bowl sink INSET size:860x 420 x200mm complete with Single Lever Cobra mixer tap swivel , plastic bottle trap, Pop-up & waste plug	No	**0**		
E	Ditto but double bowl,double drain Size:1500x490x200mm deep	No	**0**		
	Cleaners Sink				
F	“Duravit” or equal stainless steel cleaners sink size 500x480x280mm INSET to be fixed on concrete counter to inclusive of Cobra single lever tap grid waste fitting pad, plastic bottle trap.	No	**0**		
	Instant Shower Heater				
G	'Lorenzetti'' Instant shower Heater as "Lorenzetti" or equal and approved.	No.	**1**		
	Instant Heater -5L				
H	'Lorenzetti '' under sink instant heater complete	No.	**0**		
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House Total Carried Forward To Collection Page				
			E/53		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No1: SANITARY APPLIANCES				
	Collection Page				
	Brought forward from Page E/51				
	Brought forward from Page E/52				
	Brought forward from Page E/53				
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Main Collection Page**				
			E/54		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Internal Plumbing				
	Supply and install Polypropylene (PPR) pipes PN20, tubing and fittings as described and shown on the drawings. The pipes shall be produced as per SDR 11 and shall meet or exceed the requirements as of ASTM D 2846, current European standards for PPR installations and to the Engineers approval. All joints shall be assembled employing solvent cements that meet or exceed the requirements of ASTM F442 and ASTM F441. Rates must allow for all Metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints, support raceways, isolating sheaths, elastic materials, expansion arms and bends, crossovers, 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. The pipes will be pressure tested before the plastering of wall commences and as per the manufacturers recommended testing pressures.				
	PPR Pipework -Cold & Hot Water				
A	50mm dia PPR Pipe	LM	0		
B	40mm -ditto-	LM	112		
C	32mm -ditto-	LM	120		
D	25mm -ditto-	LM	128		
E	20mm -ditto-	LM	112		
	Extra-over PPR pipework for the following:-				
	Bend/elbow				
F	50mm bend	No	0		
G	40mm bend	No	10		
H	32mm bend	No	32		
I	25mm bend	No	24		
J	25x1/2" dia male threaded 90o bend	No	36		
K	25x1/2"dia female threaded 90o bend	No	46		
	Tee				
L	20mm diameter equal tee	No	32		
M	25mm diameter equal tee	No	34		
N	25x1/2" female threaded tee	No	33		
O	25x1/2" male threaded tee	No	33		
P	32mm diameter equal tee	No	23		
Q	40mm diameter equal tee	No	27		
R	50mm diameter equal tee	No	23		
	Union				
S	20mm ditto	No	31		
T	25mm ditto	No	31		
U	32mm ditto	No	27		
V	40mm ditto	No	28		
W	50mm ditto	No	16		
	Proposed (B-STEP), Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Collection Page**				
			E/55		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Reducer				
A	25/20mm reducers	No	26		
B	32/25mm reducers	No	22		
C	40/32mm reducers	No	26		
D	50/32mm reducers	No	24		
	Gate Valve				
E	25mm dia "Peglers" gate valve	No	5		
F	32mm -ditto	No	3		
G	40mm -ditto	No	3		
H	50mm -ditto	No.	0		
	Flexible connector				
H	450mm flexible connector with chrome plated angle check valve size 15mm dia including unions and sockets to connect sanitary fittings to PP-R Pipework (To be part of Sanitary Fittings)	No.	10		
	Proposed (B-STEP), Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Collection Page**				
			E/56		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Bill No2: Internal Plumbing				
	Collection Page				
	Brought forward from Page E/55				
	Brought forward from Page E/56				
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Main Collection Page**				
			E/57		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Foul Water Internal Drainage				
	Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. 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.				
	MuPVC and uPVC Waste and Soil Pipework				
A	200mm mUPVC Pipe	LM	0		
B	150mm diameter heavy gauge grey mUPVC pipe	LM	120		
C	100mm diameter heavy gauge golden brown UPVC pipe	LM	126		
D	50mm diameter waste pipe	LM	90		
E	40mm diameter waste pipe	LM	72		
	Bend				
E	150mm diameter access bend	No.	0		
F	100mm diameter access bend	No.	11		
G	150mm diameter sweep bend	No.	0		
H	100mm diameter sweep bend	No.	6		
I	50mm diameter sweep bend	No.	18		
J	40mm diameter sweep bend	No.	15		
	Tee				
K	150mm diameter sweep tee	No.	21		
L	100mm diameter sweep tee	No.	23		
M	50mm diameter sweep tee	No.	15		
N	40mm diameter sweep tee	No.	18		
	Access Cap				
O	150mm diameter access cap	No.	7		
P	100mm diameter access cap	No.	15		
Q	50mm diameter access cap	No.	15		
R	40mm diameter access cap	No.	13		
	Boss Connector				
S	100 x 50mm diameter boss connector	No.	12		
T	50 x 40mm diameter boss connector	No.	10		
	Single Branch				
U	100mm diameter single branch	No.	5		
V	50mm diameter single branch	No.	8		
	WC Connector				
X	100mm diameter WC connector	No.	5		
	Trap				
Y	100 x 50mm diameter floor trap and grating	No.	8		
Z	600mm stainless steel linear shower drain	No.	2		
AA	50 x 50mm diameter U-shaped tubular trap	No.	5		
	Testing and Commissioning				
CC	Allow for testing and commissioning of the plumbing and drainage installations to the satisfaction of the Engineer.	Item	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Collection Page**				
			E/58		

Item	Description	Unit	Qty	Rate (Kshs)	Total (Kshs)
	Portable Fire Extinguisher				
A	Supply, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.				
	Carbon Dioxide Gas Fire Extinguisher				
B	9L carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Carbon Dioxide Gas Fire Extinguisher				
C	5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	4		
	Dry Chemical Powder Fire Extinguisher				
D	9kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	2		
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Collection Page**				
			E/59		

	RAIN WATER DRAINAGE				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Rain Water Drainage				
	Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Pipework work prices includes 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.				
	Pipe				
A	150mm diameter heavy gauge grey mUPVC down pipes	LM	0		
B	100mm diameter heavy gauge grey mUPVC down pipes	LM	78		
C	50mm diameter heavy gauge grey mUPVC down pipes	LM	24		
	Bend				
C	100mm diameter bend	No.	8		
D	100mm diameter 45deg. bend	No.	6		
	Tee				
E	100mm diameter tee	No.	2		
F	150mm diameter tee	No.	2		
	Others				
G	150mm diameter cast iron fulbora	No.	1		
	Working Drawings / As Built Drawings				
T	Allow a Sum for preparation of working draiwngs / As Built drawings & Equipment Manuals	Sum	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Collection Page**				
			E/60		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	<u>Collection Page</u>				
	Bill No.1 : Sanitary Fittings				
	Bill No.2 : Internal Plumbing				
	Bill No.3 : Foul Drainage				
	Bill No.4 : Portable Fire Extinguishers				
	Bill No.5 : Rain Water Drainage				
	Proposed (B-STEP) ,Kisumu Polytechnic – Workshop & Gate House **Total Carried Forward To Summary Page**				
			E/61		

	RAIN WATER DRAINAGE – DUSTBIN AND POWERHOUSE				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Rain Water Drainage				
	Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Pipework work prices includes 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.				
	Pipe				
A	150mm diameter heavy gauge grey mUPVC down pipes	LM	0		
B	100mm diameter heavy gauge grey mUPVC down pipes	LM	24		
C	50mm diameter heavy gauge grey mUPVC down pipes	LM	6		
	Bend				
C	100mm diameter bend	No.	12		
D	100mm diameter 45deg. bend	No.	9		
	Tee				
E	100mm diameter tee	No.	2		
F	150mm diameter tee	No.	0		
	Others				
G	150mm diameter cast iron fulbora	No.	0		
	Working Drawings / As Built Drawings				
H	Allow a Sum for preparation of working draiwngs / As Built drawings & Equipment Manuals	Sum	1		
	Proposed (B-STEP) ,Kisumu Polytechnic – Dustbin & Power House **Total Carried Forward To Collection Page**				
			E/62		

	Fire Fighting Services				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Portable Fire Extinguisher				
A	Supply, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.				
	Carbon Dioxide Gas Fire Extinguisher				
B	9 litres water/carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	1		
	Carbon Dioxide Gas Fire Extinguisher				
C	5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	6		
	Dry Chemical Powder Fire Extinguisher				
D	9kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	No	6		
	Automatic Dry Chemical Powder Fire Extinguisher				
E	10kg automatic dry chemical podwer fire extinguisher complete with pressure gauge, initial charge, glass bulb, sprinkler head and mounting base. The operating temperature of the bulb shall be 68°C. The unit shall be mounted on the concrete slab ceiling using purpose-made screws and to be as Germania, model GD 25 or equal and approved.	No	2		
F	Fire blanket made of cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm. It shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket to BS 1721.	No	2		
	Proposed (B-STEP) ,Kisumu Polytechnic – Dustbin & Power House **Total Carried Forward To Collection Page**				
			E/63		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	<u>Collection Page</u>				
	Bill No.1 : Portable Fire Extinguishers				
	Bill No.2 : Rain Water Drainage				
	Proposed (B-STEP) ,Kisumu Polytechnic – Dustbin & Power House Total Carried Forward To Main Collection Page				
			E/64		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	AIRCONDITIONING (VRF)				
	Air Conditioning System - VRF				
	Outdoor Units				
A	Supply, install, test and commission air-cooled inverter VRF outdoor condensing unit complete with DC inverter scroll compressor, axial condenser fans, microprocessor controls and all accessories. Unit shall have a cooling capacity of **102,000 BTU/h**r suitable for 415V/3Ph/50Hz power supply using R410A/R32 refrigerant, and designed for multi indoor unit operation with energy efficient modulation and weatherproof casing. The outdoor unit to be as **'LG VRF/VRV** Series outdoor unit ' or approved equivalent	No.	0		
B	Ditto but **18,000 Btu/hr**	No.	0		
	4-Way Ceiling mounted Cassette		0		
C	7.0kW(24,000Btu/Hr) Cassette Unit	No	0		
D	5.2kW(18,000Btu/Hr) Cassette Unit	No.	0		
E	3.5 kW(12,000Btu/Hr) Cassette Unit	No.	0		
F	2.8kW(9,6000Btu/Hr) Cassette Unit	No.	0		
	Supply and Install the following;		0		
G	**High wall Split type** air conditioner.Capacity (3.5kW, 12,000 Btu/Hr), Cooling /heating.To be supplied complete with room thermometer, room thermostat control and wireless remote control device.It shall be charged with R410A/R32 refrigerant or any other non-ozone depleting refrigerant. The unit shall be such that if the Power supply goes off, it will start automatically after power is restored with three minutes delay.The outdoor unit shall have matching capacity with Indoor unit. The unit shall be **"LG "**model or equal and approved.	No.	1		
	Surge Protector (AVS)				-
H	Power Surge protector as "Solatek" to suite or equal and approved.	No.	1		
	Flexible Ductwork				
I	100mm diameter flexible ducting including fixing clamps complete with insulation	LM	0		
J	**Y-Branches**	No	3		
	Refrigerant				
K	Allow R410A extra refrigerant for charging all the VRF air conditioning systems described above.	Item	2		
	Roof Ventilation				
L	Wind-driven roof ventilators,400 mm dia, corrosion-resistant aluminum/galvanized steel, powder-coated/galvanized, with flashings, supports, weatherproofing, free-rotating.	No.	20		
	Proposed (B-STEP), Kisumu Polytechnic - Airconditioning (VRF) **Total Carried Forward to Main Collection Page**				
			E/65		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	MOUNTING BRACKET				
A	Mounting bracket for the outdoor unit complete with a cage and provided with purpose-made protective steel iron angle frame and all other anchoring accessories including rawl bolts and anti-vibration rubber mountings to engineer's approval.	No.	2		
	Trunking				
B	200mmX150mm perforated cable complete with brackets approved trunking for concealing the refrigerant pipework at the roof top	LM	125		
	Refrigerant Pipework				
	Supply, deliver and install copper tubing to BS 2871: part1 and capillary and compression fittings to BS 864: part 2. Tubing must be solid drawn round, clean, smooth and free from defects and from deleterious films in the bore. The fittings must be free from internal fins or other irregularities. Compression fittings shall be Type A (non-manipulative). Allow in pipework prices for pipe support, clips and cradles, bends, tees, insulation, branches, joining fixing and any other accessories for proper and satisfactory functioning of the system.				
	Copper Pipework and Insulation				-
C	34.9mm diameter insulated copper pipe	Lm	10		
D	28.575mm diameter insulated copper pipe	Lm	10		
E	22.225mm diameter insulated copper pipe	Lm	10		
F	19.1 mm diameter insulated copper pipe	Lm	10		
G	15.875mm diameter insulated copper pipe	Lm	6		
H	12.70mm diameter insulated copper pipe	Lm	8		
I	9.525mm diameter insulated copper pipe	Lm	6		
J	6.35mm diameter insulated copper pipe	Lm	10		
	Bend				
I	34.9mm diameter copper bend	No.	5		
J	28.875mm diameter copper bend	No.	4		
K	22.225mm diameter copper bend	No.	6		
L	19.1mm diameter copper bend	No.	7		
M	15.875mm diameter copper bend	No.	8		
	PVC Drain Pipework				
N	32mm diameter grey uPVC pipework	Lm	9		
O	32mm diameter bend/elbow	No.	10		
P	32mm equal tee	No.	6		
	Electrical Works				
O	Allow for associated electrical works including but not limited to wiring from local isolators/DP Switches provided by others within one meter to all indoor units, outdoor units and control system. Allow for labeling all the circuits and equipment.	Item	1		
	Proposed (B-STEP), Kisumu Polytechnic - Airconditioning (VRF) **Total Carried Forward to Main Collection Page**				
			E/66		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	Air Handling Unit				
	Outdoor Unit				
A	Supply, install, test and commission air cooled inverter VRF outdoor condensing unit complete with high efficiency scroll compressors, condenser coils, condenser fans, refrigerant charge, microprocessor controls, anti-corrosion coated heat exchanger, vibration isolation mounts and all necessary accessories. Unit to be suitable for connection to 2 No. indoor ceiling suspended AHUs each of 20kW capacity, total cooling capacity not less than 45kW, operating on 415V/3Ph/50Hz power supply using R410A or R32 refrigerant complete with weatherproof casing and factory supplied controls. The outdoor unit to be as **'LG VRF/VRV** Series outdoor unit ' or approved equivalent	No.	1		
	Indoor Unit				
B	Supply, install, test and commission ceiling suspended concealed type indoor Air Handling Unit complete with DX cooling coil, centrifugal fan, washable filters, insulated casing, condensate drain tray, controls, flexible duct connections and all necessary accessories, cooling capacity 20kW, airflow 1.2m³/s, suitable for connection to VRF outdoor unit using R410A/R32 refrigerant.	No.	2		
	Ductwork				
C	Galvanised mild steel ductwork 1 mm (20G) thick complete with bends, transformation pieces, offsets, branch duct take offs, flanges, hangers, supports, sleeves, flexible connections, access doors, test holes with plugs, stiffeners, expanders, reducers, turning vanes, insulation and any other for completion	SM	300		
	Supply Air Jet Diffusers				
D	600mm × 600mm square ceiling supply air diffusers complete with dampers	No.	12		
	Linear Exhaust Air Register				
E	1200mm × 600mm return air egg crate grilles	No.	12		
F	Fresh air weather louvres complete with bird/insect screen	No.	10		
	Motorized Fire Dampers				
G	Supply and install motorized fire damper 800*500	No.	1		
H	Supply and install motorized fire damper 750*600	No.	1		
I	Supply and install motorized fire damper 600*500	No.	1		
	Volume Control Damper				
J	Opposed blade balancing damper size 900x 500mm with leaf thickness of 2.0 mm with manual control. Allow for test holes and plugs in the ductwork for balancing. As manufactured by "WATERLOO OZONAIR" Series WVC or equal and approve	No.	2		
K	Ditto but size 700x400mm	No.	2		
L	Ditto but size 600x350mm	No.	2		
M	Ditto but size 450x450mm	No.	4		
	Proposed (B-STEP), Kisumu Polytechnic - Airconditioning (VRF) **Total Carried Forward to Main Collection Page**				

			E/67		
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
	Flexible Ductwork				
A	300mm diameter Aluminium Flexible Ducting with high strength wire helix.	Lm	**128**		
B	Allow for Fire Control system Inclusive of Control Panel and Communication Cabling connecting the fire dampers to Control panel Located on the roof top.	Item	**1**		
C	Allow a electrical installation associated with the AHU Including Controls to allow for BMS Compatibility for system	Item	**1**		
D	Allow for supporting the duct using angle lines and rawl bolts	Item	**1**		
E	Allow for supporting the AHU on wall brackets, mounting feet pair, anti vibration mounts and protecting the fans from elements of the weather where fixed externally on the wall and anti-theft cage	Item	**1**		
F	Allow for Balance, testing and commissioning the entire installation to the Engineer/client and Architects approval.	Item	**1**		
G	Allow for preparation of Working & As-Built Drawings	Item	**1**		
	Proposed (B-STEP), Kisumu Polytechnic - Airconditioning (VRF) **Total Carried Forward to Main Collection Page**				
			E/68		

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	Collection Page				
	Total Carried Forward from Page E/65				
	Total Carried Forward from Page E/66				
	Total Carried Forward from Page E/67				
	Total Carried Forward from Page E/68				
	Proposed (B-STEP), Kisumu Polytechnic - Airconditioning (VRF) **Total Carried Forward to Summary Page**				
			E/69		

	SECTION: 9.0				
	TITLE: SUMMARY PAGE				
ITEM	**DESCRIPTION**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
2.0	**Summary Page**				
2.1	Total for Common Services				
2.2	Total for Administration Building				
2.3	Total for Teaching Building				
2.4	Total for Restaurant				
2.5	Total for Aqua Centre				
2.6	Total for Workshops				
2.7	Total for Gate House & Power House				
2.8	Heating Ventilation & Air Conditioning System				
2.9	Allow for Preparation of Working drawings, As-Built Drawings and all the necessary printing.	Item	1		
	Kisumu Polytechnic-Main Mechanical Page **Total Carried Forward to Main Summary Page**				
		E/70			

SECTION F

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

SCHEDULE OF UNIT RATES

ITEM	**DESCRIPTION**	**UNIT**	**RATE (Kshs)**
1.	Sluice valve 100mm	No.	
2.	Fire blanket	LM	
3.	Allow for the construction of a standard pump house	No.	
4.	65mm Fire Hydrant (above Ground)	No.	
5.	Ceramic Slab urinal and cistern with dividers of length 3m	No.	
6.	30 gallons Hot Water Cylinder with 3 kw element	No.	
7.	32mm flush valve	No.	
.8	40mm flush valve	No.	
9	Concealed 9.0 cistern with push button	No.	
10	Multistage Submersible Centrifugal pump o flow rate of $5m^3/hr$ at a head of 35m as GRUNDFOS SP 5A – 8	No	
11	Drainage sump pump as **' Linz'** with a flow rate of $4.5m^3/h$ at a head of 15m. Power 0.75 Kw single phase		
12	1800mm stainless steel slab urinal complete with a 9 litre cistern and necessary pipework.		

SCHEDULE OF UNIT RATES

Item	Description	Kshs.
1.	Mixer tap	
2.	Sensor tap	
3.	Push tap	
4.	Flush valves	
5.	Coloured WC suite complete with cistern	
6.	Coloured washhand basin on pedestal	
7.	Ditto but counter top	

SECTION F:

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

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TECHNICAL SCHEDULE

General Notes to the Tenderer

The tenderer shall submit technical schedules for all materials and equipment upon which he has based his tender sum.

The tenderer shall also submit separate comprehensive descriptive and performance details for all plant apparatus and fittings described in the technical schedules. Manufacturer's literature shall be accepted. Failure to comply with this may have his tender disqualified.

Completion of the technical schedule shall not relieve the Contractor from complying with the requirements of the specifications except as may be approved by the Engineer.

TECHNICAL SCHEDULE

ITEM	DESCRIPTION	**MANUFACTURER**	**COUNTRY OF ORIGIN**	**REMARKS (Catalogue No.etc.)**
1	Water closets			
2	Wash hand basin			
3	Soap dispenser			
4	Toilet roll holder			
5	Soap Dish			
6	Kitchen Sink			
7	Hand drier			
8	Urinals			
9	Under Sink Water Heater			
10	Disabled persons WC and WHB			
11	UPVC pipes			
12	GMS Pipes			
13	Gate valves			
14	Non-return valves			
15	PPRC pipes			
16	Fire Signage			
17	Fire Extinguishers			
18	Hose reel			
19	Fire Hydrants			
20	Landing valves and Breeching valves			
21	Water Booster pumps			
22	Hosereel Pumps			
23	Solar Panel			
24	Solar cylinders			

CONTRACTUAL DRAWINGS

R621/01E

PROPOSED BLUE SKILLS TRAINING FOR EMPLOYMENT CENTRE (BSTEC) FOR THE KISUMU NATIONAL POLYTECHNIC ON KISUMU MUNICIPALITY / BLOCK 9 / 101

SPECIFICATIONS AND BILLS OF QUANTITIES VOLUME 2 – ELECTRICAL WORKS

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GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

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2.37 Timing Control Switch

2.38 Wiring System for Street Lighting

2.39 Metal control Pillar

2.40 Current Operated Earth leakage circuit breaker

2.41 MV Switchboard

2.42 Steel Conduits and Steel Trunking

2.43 Testing on Site

2.1 GENERAL

This specification is to be read in conjunction with the drawings which are issued with it. Bills of quantities shall be the basis of all additions and omissions during the progress of the works.

2.2 STANDARD OF MATERIALS

Where the material and equipment are specifically described and named in the Specification followed by approved equal, they are so named or described for the purpose of establishing a standard to which the sub-contractor shall adhere.

Should the Sub-contractor install any material not specified herein before receiving approval from the proper authorities, the Engineer shall direct the Sub-contractor to remove the material in question immediately. The fact that this material has been installed shall have no bearing or influence on the decision by the Engineer.

All materials condemned by the Engineer as not approved for use, are to be removed from the premises and suitable materials delivered and installed in their place at the expense of the Sub-contractor. All materials required for the works shall be new and the best of the respective kind and shall be of a uniform pattern.

2.3 **WORKMANSHIP**

The workmanship and method of installation shall conform to the best standard practice. All work shall be performed by a skilled tradesman and to the satisfaction of the Engineer. Helpers shall have qualified supervision.

Any work that does not in the opinion of the Engineer conform to the best standard practice will be removed and reinstated at the Sub-contractor's expense.

Permits, Certificates or Licences must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licences exist under Government legislation.

2.4 PROCUREMENT OF MATERIALS

The sub-contractor is advised that no assistance can be given in the procurement or allotment of any materials or products to be used in and necessary for the construction and completion of the work.

Sub-contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required.

2.5 SHOP DRAWINGS

Before manufacture or Fabrication is commenced the sub-contractor shall submit Two copies of detailed drawings of all control pillars, meter cubicles, medium voltage switchboards including their components showing all pertinent information including sizes, capacities, construction details, etc, as may be required to determine the suitability of the equipment for the approval of the Engineer. Approval of the detailed drawings shall not relieve the sub-contractor of the full responsibility of errors or the necessity of checking the drawings himself or of furnishing the materials and equipment and performing the work required by the plans and specifications.

2.6 RECORD DRAWINGS

These diagrams and drawings shall show the completed installation including sizes, runs and arrangements of the installation. The drawings shall be to scale not less than 1 :50 and shall include plan views and section.

The drawings shall include all the details which may be useful in the operation, maintenance or subsequent modifications or extensions to the installation.

Three sets of diagrams and drawings shall be provided, all to the approval of the Engineer.

One coloured set of line diagrams relating to operating and maintenance instructions shall be framed and, mounted in a suitable location.

2.7 REGULATIONS AND STANDARDS

All work executed by the Sub-contractor shall comply with the current edition of the “Regulations” for the Electrical Equipment of Buildings, issued by the Institution of Electrical Engineers, and with the Regulations of the Local Electricity Authority.

Where the two sets of regulations appear to conflict, they shall be clarified with the Engineers. All materials used shall comply with relevant Kenya Bureau of Standards Specification.

2.8 SETTING OUT WORK

The sub-contractor at his own expenses; is to set out works and take all measurements and dimensions required for the erection of his materials on site; making any modifications in details as may be found necessary during the progress of the works, submitting any such modifications or alterations in detail to the Engineer before proceeding and must allow in his Tender for all such modifications and for the provision of any such sketches or drawings related thereto.

2.9 POSITIONS OF ELECTRICAL PLANT AND APPARATUS

The routes of cables and approximate positions of switchboards etc, as shown on the drawings shall be assumed to be correct for purpose of Tendering, but exact positions of all electrical Equipment and routes of cables must be agreed on site with the Engineer before any work is carried out.

2.10 MCB DISTRIBUTION PANELS AND CONSUMER UNITS

All cases of MCB Panels and consumer units shall be constructed in heavy gauge sheet with hinged covers.

Removable undrilled gland plates shall be provided on the top and bottom of the cases. Miniature circuit breakers shall be enclosed in moulded plastic with the tripping mechanism and arc chambers separated and sealed from the cable terminals.

The operating dolly shall be trip free with a positive movement in both make and break position. Clear indication of the position of the handle shall be incorporated.

The tripping mechanism shall be on inverse characteristic to prevent tripping in temporary overloads and shall not be affected by normal variation in ambient temperature.

A locking plate shall be provided for each size of breaker; A complete list of circuit details on typed cartridge paper glued to stiff cardboards and covered with a sheet of perspex, and held in position with four suitable fixings, shall be fitted to the inner face of the lids of each distribution panel. The appropriate MCB ratings shall be stated on the circuit chart against each circuit in use: Ivorine labels shall be secured to the insulation barriers in such a manner as to indicate the number of the circuits shown on the circuit chart.
Insulated barriers shall be fitted between phases, and neutrals in all boards, and to shroud live parts.

Neutral cables shall be connected to the neutral bar in the same sequence as the phase cables are connected to the MCB's . This shall also apply to earth bars when installed.

2.11 FUSED SWITCHGEAR AND ISOLATORS

All fused switchgear and isolators whether mounted on machinery, walls or industrial panels shall conform to the requirements of KS 04 – 226 PART: 1: 1985.

All contacts are to be fully shrouded and are to have a breaking capacity on manual operations as required by KS 04 – 182: 1980.

Fuse links for fused switches are to be of high rupturing capacity cartridge type, conforming to KS 04 – 183: 1978.

Isolators shall be load breaking/fault making isolators.

Fused switches and isolators are to have separate metal enclosures. Mechanical interlocks are to be provided between the door and main switch operating mechanism so arranged that the door may not be opened with the switch in the 'ON' position. Similarly; it shall not be possible to close the switch with the door open except that provision to defeat the mechanical interlock and close the switch with the door in the open position for test purposes. The 'ON' and 'OFF' positions of all switches and isolators shall be clearly indicated by a mechanical flag indicator or similar device. In T.P & N fused switch units, bolted neutral links are to be fitted.

2.12 CONDUITS AND CONDUIT RUNS

Conduit systems are to be installed so as to allow the loop-in system of wiring:

All conduit shall be black rigid super high impact heavy gauge class 'A' PVC in accordance with KS 04 – 179: 1988 and IEE Regulations. No conduit less than 20mm in diameter shall be used anywhere in this installation.

Conduit shall be installed buried in plaster work and floor screed except when run on wooden or metal surface when they will be installed surface supported with saddles every 600mm. Conduit run in chases shall be firmly held in position by means of substantial pipe hooks driven into wooden plugs.

The Sub-contractor's attention is drawn to the necessity of keeping all conduits entirely separate from other piping services such as water and no circuit connections will be permitted between conduits and such pipes. All conduits' systems shall be arranged wherever possible to be self-draining to switch boxes and conduit outlet points for fittings:

The systems, when installed and before wiring shall be kept plugged with well-fitting plugs and when short conduit pieces are used as plugs, they shall be doubled over and tied firmly together with steel wire; Before wiring all conduit systems shall be carried out until the particular section of the conduit installation is complete in every respect.

The sets and bends in conduit runs are to be formed on site using appropriate size bending springs and all radii of bends must not be less than 2.5 times the outside diameter of the conduit. No solid or inspection bends, tees or elbows will be used.

Conduit connections shall either be by a demountable (screwed up) assembly or adhesive fixed and water tight by solution. The tube and fittings must be clean and free of all grease before applying the adhesive. When connections are made between the conduit and switch boxes, circular or non-screwed boxes, care shall be taken that no rough edges of conduit stick out into the boxes.

Runs between draw in boxes are not to have more than two right angle bends or their equivalent . The sub-contractor may be required to demonstrate to the Engineers that wiring in any particular run is easily withdrawable and the sub-contractor may, at no extra cost to the contract; be required to install additional draw-in boxes required. If conduit is installed in straight runs in excess of 6000mm, expansion couplings as manufactured by Egatube shall be used at intervals of 6000mm.

Where conduit runs are to be concealed in pillars and beams, the approval of the Structural Engineer, shall be obtained. The sub-contractor shall be responsible for marking the accurate position of all holes, chases etc, on site, or if the Engineer so directs, shall provide the Main Contractor with dimensional drawings to enable him to mark out and form all holes and chases. Should the sub-contractor fail to inform the main contractor of any inaccuracies in this respect they shall be rectified at the sub-contractor's expense.

It will be the Sub-contractor's responsibility to ascertain from site, the details of reinforced concrete or structural steelwork and check from the builder's drawings the positions of walls, structural concrete and finishes. No reinforced concrete or steelwork may be drilled without first obtaining the written permission of the Structural Engineer.

The drawings provided with these specifications indicate the appropriate positions only of points and switches, and it shall be the Sub-Contractors responsibility to mark out and centre on site the accurate positions where necessary in consultation with the Architect and the Engineer. The sub-contractor alone shall be responsible for the accuracy of the final position.

2.13 CONDUIT BOXES AND ACCESSORIES

All conduit outlets and junction boxes are to be either malleable iron and of standard circular pattern of the appropriate type to suit saddles being used or super high impact PVC manufactured to KS 04 – 179: 1983.

Small circular pattern boxes are to be used with conduits up to and including 25mm outside diameter. Rectangular pattern adaptable boxes are to be used for conduits of 32mm outside diameter and larger. For drawing in of cables in exposed runs of conduit, standard pattern through boxes are to be used:

Boxes are to be not less than 50mm deep and of such dimensions as will enable the largest appropriate number of cables for the conduit sizes to be drawn in without excessive bending.

Outlet boxes for lighting fittings are to be of the loop-in type where conduit installation is concealed and the sub-contractor shall allow one such box per fitting, except where fluorescent fittings are specified when two such boxes per fitting shall be fitted flush with ceiling and if necessary fitted with break joint rings. Pattresses shall be fitted where required to outlets on surface conduit runs.

Adaptable boxes are to of PVC or mild steel (of not less than 12swg) and black enamelled or galvanised finish according to location. They shall be of square or oblong shape location. They shall be of square or oblong shape complete with lids secured by four 2 BA brass roundhead screws; No adaptable box shall be less than 75mm x 75mm x 50mm or larger than 300mm x 300mm x 75mm and shall be adequate in depth in relation to the size of conduit entering it. Conduits shall only enter boxes by means of conduit bushes.

2.14 LABELS

Labels fitted to switches and fuseboards;-

(i) Shall be Ivorine engraved black on white.

(ii) Shall be secured by R.H brass screws of same manufacturing throughout.

(iii) Shall be indicated on switches:-
- a) Reference number of switch
- b) Special current rating
- c) Item of equipment controlled

(iv) Shall indicate on MCB panels
- a) Reference number
- b) Type of board, i.e;, lighting, sockets, etc,.
- c) Size of cable supplying panel
- d) where to isolate feeder cable

(v) Shall be generally not less than 75mm x 50mm.

2.15 EARTHING

The earthing of the installation shall comply with the following requirements;-

(i) It shall be carried out in accordance with the appropriate sections of the current edition of the Regulations, for the Electrical Equipment of Buildings issued by Institute of Electrical Engineers of Great Britain.

(ii) At all main distribution panels and main service positions a 25mm x 3mm minimum cross sectional area Copper tape shall be provided and all equipment including the lead sheath and armouring of cables, distribution boards and metal frames shall be bonded thereto.

(iii) The earth tape in Sub-clause (ii) shall be connected by means of a copper tape or cable of suitable cross sectional area to an earth electrode which shall be a copper earth rod (see later sub-clause).

(iv) All tapes to be soft high conductivity copper, untinned except where otherwise specified and where run underground on or through walls, floors, etc., it shall be served with corrosion resisting tape or coated with corrosion compound and braided

(v) Where the earth electrode is located outside the building a removable test link shall be provided inside the building as near as possible to the point of entry to the tape, for isolating the earth electrode for testing purposes.

(vi) Earthing of sub-main equipment shall be deemed to be satisfactory where the sub-main cables are M.I.C.S. or conduit with separate earth wire, and installation is carried out in accordance with the figures stated in the current edition of the I.E.E Regulations.

(vii) Where an earth rod is specified (see Sub-clause (iii) it shall be proprietary manufacture, solid hand drawn copper of 15mm diameter driven into the ground to a minimum depth of 3.6m . It shall be made up to 1.2m sections with internal screw and socket joints and fitted with hardened steel tip and driving cap.

(viii) Earth plates will not be permitted

(ix) Where an earth rod is used the earth resistance shall be tested in the manner described in the current edition of the IEE Regulations, by the Sub-Contractor in the presence of the Engineer and the Sub-Contractor shall be responsible for the supply of all test equipment.

(x) Where copper tape is fixed to the building structure it structure it shall be by means of purpose made non-ferrous saddles which space the conductor away from the structure a minimum distance of 20mm. Fixings, shall be made using purpose made plugs; No fixings requiring holes to be drilled through the tape will be accepted.

(xi) Joints in copper tape shall be tinned before assembly riveted with a minimum of two copper rivets and seated solid.

(xii) Where holes are drilled in the earth tape for connection to items of equipment the effective cross sectional area must not be less than required to comply with the IEE regulations.

(xiii) Bolts, nuts and washers for any fixing to the earth tape must be of non-ferrous material.

(xiv) Attention is drawn to the need for the earthing metal parts of lighting fittings and for bonding ball joint suspension in lighting fittings.

2.16 CABLES AND FLEXIBLE CORDS

All cables used in this Sub-Contract shall be manufactured in accordance with the current appropriate Kenya standard Specification which are as follows: -

P.V.C. Insulated Cables and Flexible Cords - Ks 04-192:1988

Pvc Insulated Armoured Cables - Ks 04-194:1990

Armouring of Electric cables - Ks 04-290:1987

The successful Sub-Contractor will, at the Engineers discretion be required to submit samples of cables for the Engineers approval; the Engineer reserves the right to call for the cables of an alternative manufacture without any extra cost being incurred.

P.V.C. insulated cables shall be 500/1000-volt grade. No cables smaller than 1.5mm² shall be used unless otherwise specified. The installation and the finish of cables shall be as detailed in later clauses. The colour of cables shall conform with the details stated in the "Cable Braid and insulation Colours" Clause.

2.17 ARMOURED P.V.C. INSULATED AND SHEATHED CABLES:

Shall be 600/1000 volt grade manufactured to Ks 04-194:1988 and Ks 04-187/188 with copper stranded conductors.

The wire armour of the cable shall be used wholly as an earth continuity conductor and the resistance of the wire armour shall have a resistance not more than twice of the largest current carrying conductor of the cable.

P.V.C./S.W.A./P.V.C. cables shall be terminated using "Telecom" "B" type or approved equal or approved equal glands and a P.V.C. tapered sleeve shall be provided to shroud each gland.

Where cables rise from floor level to switchgear etc., they shall be protected by P.V.C. conduit, to a height of 600mm from finished floor level, whether the cable is run on the surface or recessed into the wall.

2.18 CABLE SUPPORTS, MARKERS AND TILES

All PVC/SWA/PVC cables run inside the building shall be fixed in rising ducts or on ceilings by means of die cost cables hooks or clamps, or appropriate size to suit cables, fixed by studs and back nuts to their channel sections.

Alternatively, fixing shall be by BICC claw type cleating system with die-cast cleats and galvanised mild steel back straps or similar approved equal method. For one or two cables run together the cleats shall be fixed a special channel section supports or backstraps described above which shall in turn be secured to walls or ceilings of ducts by rawbolts.

In excessively damp or corrosive atmospheric conditions special finishes may be required and the Sub-contractor shall apply to the Engineer for further instructions before ordering cleats and channels for such areas.

The above type of hooks and clamps and channels or cleats and blackstraps shall also be used for securing cables in vertical ducts.

Cables supports shall be fixed at 600mm maximum intervals, the supports being supplied and erected under this Sub-contract. Saddles shall not be used for supporting cables nor any other type of fixing other than one of the two methods described above or other system which has received prior approval of the Engineer;

Cables are to be kept clear of all pipe work and the Sub-contractor shall work in close liaison with other services Sub-contractors.

The Sub-Contractor shall include for the provision of fixing of approved type coloured slip on cables end markers to indicate permanently the correct phase and neutral colours on all ends.

Provision shall be made for supplying and fixing approved non-corrosive metal cable markers to be attached to the outside of all PVC/SWA/PVC cables at 15mm intervals indicating cable size and distinction.

Where PVC/SWA/PVC cables are outside the building they shall be laid underground 750mm deep with protecting concrete interlocking cover tiles laid over which shall be provided and laid under this Sub-contract.

All necessary excavations and reinstatement of ground including sanding or trenches will be carried out by the Sub-Contractor, unless otherwise stated.

2.19 PVC INSULATED CABLES

Shall be of non-braided type as CMA reference 6491 x 600/1000/1000 volt grade cables, or equal and approved.

PVC cables shall conform to the details of the " Cables and Flexible cords" and "Cable Braid and Insulation Colours" clauses.

2.20 HEAT RESISTING CABLES

Final connections to cookers, water heaters, etc., shall be made using butyl rubber insulated cable as CMA reference 610 butyl (Single core 600/1000 Volt).

This type of cable shall be used in all instances where a temperature exceeding 100°F, but not exceeding 150°F is likely to be experienced. Final connections to all lighting fittings (and other equipment where a temperature in excess of 150°c likely to be experienced) shall be made using silicon rubber insulated cable or equal and approved.

2.21 FLEXIBLE CORDS

Shall be in accordance with the "Cable and Flexible Cords" clause. No cord shall be less than 24/0.2mm in size unless otherwise specified.

Circular white twin TRS flex shall be used for plain pendant fittings up to 100 watts. For all other types of lighting fittings the flexible cable shall be silicone rubber insulated.

No polythene insulated flexible cable shall be used in any lighting fitting or other appliance (see "Heat Resisting Cables" Clause 30).

2.22 CABLE ENDS AND PHASE COLOURS

All cable ends connected up in switchgear, MCB panels etc;, shall have the insulation carefully cut back and the ends sealed with Hellerman rubber slip on cable end markers.

The markers shall be of appropriate phase colour for switch and all other live feeds to the details of the "Cable Insulation Colours" clause. Black cable with black end markers shall only be used for neutral cables.

2.23 CABLE INSULATION COLOURS

Unless otherwise stated in later clauses the insulation colours shall be in accordance with the following table.

Where other systems are installed the cable colours shall be in accordance with the details stated in the appropriate clause.

SYSTEM	INSULATION COLOUR	CABLE END MARKER
1.) Main and Sub-Main		
a) Phase	**Red**	**Red**
b) Neutral	**Black**	**Black**
2). Sub-Circuits		
Single Phase		
a) Phase	**Red**	**Red**
b) Neutral	**Black**	**Black**

2.24 SUB-CIRCUIT WIRING

For all lighting and sockets wiring shall be carried out in the "looping in" system and there shall be no joints whatsoever. No lighting circuits shall comprise more than 20 points when protected by 10A MCB. Cables with different cross-section area of copper shall not be used in combination.

Lighting circuits P. V.C. cable.

1.5mm² for all lighting circuits indicated on the drawing.

Power circuits P.V.C cable(minimum sizes).

(i) 2.5mm² for one, two or three 5Amp sockets wired in parallel.

(ii) 2.5mm² for one 15Amp socket.

(iii) 2.5mm² for maximum of ten switched 13 Amp sockets wired from 30 Amp MCB.

The wiring sizes for lighting circuits and sockets are shown on the drawings. In such cases, the sizes shown on the drawings shall prevail over the sizes specified.
Wiring sizes for other appliances shall be shown on the drawing or specified in later clauses of this specification.

2.25 SPACE FACTOR

The maximum number of cables that may be accommodated in a given size of conduit or trunking or duct is not to exceed the number in Tables B.5 and B.6 or as stated in Regulation B.91, B.117 and B.118 of the I.E.E Regulations whichever is appropriate.

2.26 INSULATION

The insulation resistance to earth and between poles of the whole wiring system, fittings and lumps, shall not be less than the requirements of the latest edition of the I.E.E Regulations. Complete tests shall be made on all circuits by the Sub-contractor before the installations are handed over.

A report of all tests shall be furnished by the Sub-Contractor to the Engineer. The Engineer will then check test with his own instruments if necessary.

2.27 LIGHTING SWITCHES

These shall be mounted flush with the walls, shall be contained in steel or alloy boxes and shall be of the gangs ratings and type shown in the drawings. They shall be as manufactured by M.K. Electrical Ltd., or other equal and approved to KS 04 – 247: 1988

2.28 SOCKETS AND SWITCHED SOCKETS
These shall be flush pattern in steel/pvc box and shall be of the gangs and type specified in the drawings.

They shall be 13- Amp, 3-pin, shuttered, switched and as manufactured by "M.K. Electrical Co. Ltd.", or other approved equal to KS 04 – 246: 1987

2.29 FUSED SPUR BOXES
These shall be flush, D.P switched as in steel/pvc box and of type and make specified in the drawings complete with pilot light and as manufactured by "M. K. Electrical Company Ltd", or other approved equal. KS 04 – 247: 1988

2.30 COOKER OUTLETS
These shall be flush mounted with 13-A switched socket outlet and neon indicator Lamps.

The cooker control units shall be as manufactured by "M.K. Electrical Company Ltd", or other approved equal KS 04 – 247: 1988

2.31 CONNECTORS

Shall be specified in the drawings and appropriate rating. These shall be fitted at all conduit box lighting point outlets for jointing of looped P.V.C cables with flexible cables of specified quality.

2.32 LAMPHOLDERS
Shall be of extra heavy H.O skirted and shall be provided for every specified lighting fitting and shall be B.C;, E.S;, or G.E.S as required. All E.S. and G.E.S. holders shall be heavy brass type (except for plain pendants where the reinforced bakelite type shall be used). The screwed cap of the E.S and G.E.S. holders shall be connected to the neutral.
Where Lampholders are supported by flexible cable, the holders shall have "cord grip" arrangements and in the case of metal shades earthing screws shall be provided on each of the holders.
The Sub-Contractor must order the appropriate type of holder when ordering lighting fittings, to ensure that the correct types of holders are provided irrespective of the type normally supplied by the manufacturers.

2.33 LAMPS
All lamps shall be suitable for normal stated supply voltage and the number and sizes of lamps detailed on the drawings shall be supplied and fixed. The Sub-Contractor must verify the actual supply voltage with the supply authority before ordering the lamps.

Tungsten filament lamps shall be manufactured in accordance with KS 04 – 112:1978 for general service lamps and KS 04 – 307:1985 for lamps other than general services. Tubular fluorescent lamps shall comply with KS 04 – 464:1982
Pearl lamps shall be used in all fittings unless otherwise specified.

2.34 LIGHTING FITTINGS AND STREET LIGHTING LANTERNS

This Sub-Contract shall include for the provision, handling charges, taking the delivery, safe storage, wiring (including internal wiring) assembling and erecting of all lighting fittings shown on the drawings.

All fittings and pendants shall be fixed to the conduit boxes with brass R/H screws. These to be in line with metal finish of fittings. The lighting fittings are detailed for the purpose of establishing a high standard of finish and under no circumstances will substitute fittings be permitted.
In case of rectangular shaped ceiling fittings, the extreme ends of the fittings shall be secured to suitable support in addition to the central conduit box fittings. Supports shall be provided and fixed by the Sub-Contractor.

The whole of the metal work of each lighting fittings shall be effectively bonded to earth. In the case of ball and/or knuckle joints short lengths of flexible cable shall be provided, bonded to the metal work on either side of the joints. If the above provisions are not made by the manufacturers -, the Sub-contractor shall include cost of additional work necessary in his tender. See "Flexible Cords" clause for details of internal wiring of lighting fittings. Minimum size of internal wiring shall be 20/0.20mm (23/0067). Each lighting fitting shall be provided with number type and size of lamps as detailed on the drawings. It is to be noted that some fittings are suspended as shown on the drawings.
Where two or more points are shown adjacent to each other on the drawings, e.g socket outlet and telephone outlet, they shall be lined up vertically or horizontally on the centre lines of the units concerned. Normally, the units shall be lined up on vertical centre lines, but where it is necessary to mount units at low level they shall be lined up horizontally.

2.35 POSITIONS OF POINTS AND SWITCHES

Although the approximate positions of all points are shown on the drawings, enquiry shall be made as to the exact positions of all M.C.B panels, lighting points, socket outlets etc, before work is actually commenced. The Sub-contractor must approach the Architect with regard to the final layout of all lights on the ceiling and walls.

The Sub-contractor must consult with the Engineer in liaison with the Clerk of Works, or the General Foreman on site regarding the positions of all points before fixing any conduit etc. The Sub-Contractor shall be responsible for all alterations made necessary by the non-compliance with the clause.

2.36 STREET/SECURITY OUTDOOR LIGHTING COLUMNS:

The column shall be at a minimum of 225mm in the ground on 75mm thick concrete foundations and the pole upto 150mm shall be surrounded with concrete. The top bracket and plain section of the columns shall be common to and interchangeable with all brackets with maximum mismatching tolerance of 3mm between any pole and bracket. After manufacture and before erection the columns shall be treated with an approved mordant solution which shall be washed off and the whole allowed to dry. Thereafter, the columns shall be painted with one undercoat and two coats of gloss paint to an approved colour. All columns shall be complete with fused cut-outs.

2.37 TIMING CONTROL SWITCH

These shall be installed where shown on the drawings. Photocell timing control circuits which will operate 'on' with a specified level of darkness and 'off' with a given level of light. The initial adjustment will be done with approval of the Electrical Engineer.

2.38 WIRING SYSTEM FOR STREETLIGHTING

Cables shall be as indicated on the drawings, and shall be laid in a cable trench 450mm deep along the road sides and 600mm deep across the roads and 900mm away from the road kerb or 1500mm away from the edges of the road. 'Loop-in' and 'Loop-out' arrangement shall be used at every pole. Wiring to the lanterns on each pole shall be with 1.5mm² PVC twin insulated and sheathed cable with earth wire shall be laid at least 600mm below the finished road level on a compact bed of murram at least 50mm thick and covered with a concrete surrounded 150mm thick.

2.39 METAL CONTROL PILLAR

These shall be metal clad and fabricated as per contract drawings and specification. The Sub-Contractor shall supply, install, test and commission control pillars including supplying, fixing connecting switchgears as detailed on the appropriate drawings.

2.40 CURRENT OPERATED EARTH LEAKAGE CIRCUIT BREAKER

Current operated earth leakage circuit breaker shall conform to B.S.S. 4293:68 rated at 240 volts D.P. 50 cycles A.C. Mains.

The breaker shall be provided with test switch and fitted in weather proof enclosure for surface mounting. The rated load current and earth fault operating current shall be as specified in the drawings. These shall be as manufactured by Crabtree, Siemens or other equal and approved.

2.41 M.V. SWITCHBOARD AND SWITCHGEAR

The switchboard shall be manufactured in accordance with KS04-226 which co-ordinates the requirements for electrical power switchgear and associated apparatus. It is not intended that this K.S. should cover the requirements for specified apparatus for which separate Kenyan Standard exist. All equipment and material used in the switchboard shall be in accordance with the appropriate Kenya Standard.

The switchboard shall comprise the equipment shown on the drawings together with all current transformers, auxiliary fuses, labels, small wiring and interconnections necessary for the satisfactory operation of the switchboard

Switchboard shall be of the flush fronted, enclosed, metal clad type with full front or rear access as called for in the particular specifications, suitable for indoor use, sectionalised as necessary to facilitate transport and erection. The maximum height of the switchboard is to be approximately 2.0 metres. A suitable connection chamber containing all field terminals shall be provided at the top or bottom of the switchboard as appropriate.

Before manufacture, the Sub-Contractor shall submit to the consulting Engineer for approval of detailed drawings showing the layout, construction and connection of the switchboard.

All bus-bars and bus-bar connections shall consist of high conductivity copper and be provided in accordance with KS 04-226: 1985. The bus-bars shall be clearly marked with the appropriate phase and neutral colours which should be red, yellow, blue for the phases and black for neutral.

The bus-bars shall be so arranged in the switchboard that the extensions to the left and right may be made in the future with ease should the need arise.

Small wiring, which will be neatly arranged and cleated, shall be executed in accordance with B.S. 158 and the insulation of the wiring shall be coloured according to the phase or neutral connection.

Switches and fuse switches, shall be in strict accordance with KS04-183:1978 Class 2 switches. Means of locking the switch in the "OFF" position shall be provided.

All fuse switches shall comply with KS04-183:1978, PARTS 2 and 3 a fault rating at least equal to the fault rating of the switchboard in which they are installed. Cartridge fuse links to KS 04-183:1978 category A.C. 46, class Q1 and fusing factor not exceeding 1.5 shall be supplied with each Fused switch.

Mounting arrangements shall be such that individual complete fuse switches may be disconnected and withdrawn when necessary without extensive dismantling work. When switches are arranged in their formation all necessary horizontal and vertical barriers shall be provided to ensure segregation from adjacent units. Means of locking the switch in the "OFF" position shall be provided.

2.42 STEEL CONDUITS AND STEEL TRUNKING

Conduits shall be of heavy gauge class "B" welded to Standard specification KS 04-180:1985. In no case will conduit smaller than 20mm diameter be used on the works. Conduits installed within buildings shall be black enamelled finish except where specified otherwise. Where installed externally or in damp conditions 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 service engineer.

Metal trunking shall be fabricated from mild steel of not less than 18 swg. All sections of trunking shall be rigidly fixed together and attached to the framework or fabric or the building at intervals of not less than 1.2m. Joint trunking shall not overhang fixing points by more than 0.5m.

All trunking shall be made electrically continuous by means of 25 x 3mm copper links across each joint and where the trunking is galvanised, the links shall be made by galvanised flat iron strips.

All trunking fittings (i.e. bends, tees, etc) shall leave the main through completely clear of obstructions and continuously open except through walls and floors at which points suitable fire resisting barriers shall be provided as may be necessary. The inner edge of bends and tees shall be chamfered where cables larger than 35mm² are employed.

Where trunking passes through ceilings and walls the cover shall be solidly fixed to 150mm either side of ceilings and floors and 50mm 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 of fuseboards, such connections shall be made by trunking fittings manufactured for this purpose and not by multiple conduit couplings.
Where vertical sections of trunking are used which exceed 4.5m in length, staggered tie off points shall be provided at 4.5m intervals to support the weight of cables.
Unless otherwise stated, 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 from burrs and other defects. Oil and any other insulating substance shall be removed from the screw threads; Where conduits terminate in fuse-gear, distribution boards, adaptable boxes, non-spouted switchboxes, etc., they shall, unless otherwise stated, 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 for galvanised tubing immediately after the conduits are erected. All bends and sets shall be made cold without altering the section of the conduit. The inner radius of the bed shall not be less than four(4) times the outside diameter of the conduit. Not more than two right angle bends will be permitted without the inter-position of a draw-in-box. Where straight runs of conduit are installed, draw-in-boxes shall be provided at distances not exceeding 15mm. No tees, elbows, sleeves, either of inspection or solid type, will be permitted.Conduit shall be swabbed out prior to drawing in cables, and they shall be laid so as to drain of all condensed moisture without injury to end connections.

Conduits and trunking shall be run at least 150mm clear of hot water and steam pipes, and at least 75mm clear of cold water and other services unless otherwise approved by the services engineer.
All boxes shall conform to KS 04 – 668: 1986, to be of malleable iron, and black enamelled or galvanised according to the type of conduit specified. All accessory boxes shall have threaded brass inserts.

Box lids where required shall be heavy gauge metal, secured by means of zinc plated or cadmium plated steel screws.
All adaptable boxes and lids of the same size shall be interchangeable.
Boxes used on surface work are to 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.
Where used in conjunction with mineral insulated copper sheathed cable, galvanised boxes shall be used and painted after erection.

Draw-in boxes in the floors are generally to be avoided but where they are essential they must be grouped in positions approved by the services engineer and covered and by the suitable floor traps, with non-ferrous trays and covers.

The floor trap covers are to be recessed and filled in with a material to match the floor surface.

The Sub-contractor must take full responsibility for the filling in of all covers, but the filling in material will be supplied and the filling carried out by the main building contractor.

Where buried in the ground outside the building the whole of the buried conduit is to be painted with two coats of approved bitumastic composition before covering up.

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.

2.43 TESTING ON SITE

The Sub-contractor shall conduct 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 Regulations for the electrical equipment of buildings issued by the I.E.E of Great Britain, the Government Electrical Specification and the Electric Supply Company's By-Laws.

(a) Tests shall be carried out to prove that all single pole switches are installed in the 'live' conductor.

(b) 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 each earth pin is effectively bonded to the earth continuity system. Tests shall be carried out to verify the continuity of all conductors of each 'ring' circuit.

(c) Phase tests shall be carried out on completion of the installation to ensure that correct phase sequence is maintained throughout the installation. Triplicate copies of the results of the above tests shall be provided within 14 days of the witnessed tests and the Sub-contractor will be required to issue to the service engineer the requisite certificate upon completion as required by the regulations referred to above

(d) Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation made apparently by such inspections or tests shall be rectified by the Sub-contractor at his own expense.

(e) 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 services engineer to enable him to carry out such tests as he may require.

The Sub-contractor shall generally attend on other contractors employed on the project and carry out such electrical tests as may be necessary.

The Sub-contractor shall test to the services engineer's approval and as specified elsewhere in this specification or in standards and regulations already referred to, all equipment, plant and apparatus forming part of the works and before connecting to any power or other supply and setting to work.

Where such equipment, etc., forms part of or is connected to a system whether primarily or 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 works, shall balance, regulate, test and commission the system to the service engineer's approval.

APPENDIX TO GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

The electrical sub-contractor shall comply with the following:-

1. Government Electrical Specifications No. 1 and No. 2.

2. All requirements of Kenya Power and Lighting Company Limited, IEE wiring regulations and Communications Commission of Kenya (CCK).

SECTION K

SCHEDULE OF CONTRACT DRAWINGS

DRAWING NO.	DRAWING TITLE
R621 – 001E	Site Plan- Electrical Services Layout
R621 – 002E	Admin Block Ground Floor - Power & ICT Layout
R621– 003E	Admin Block Ground Floor - Lighting Layout
R621 – 004E	Admin Block Roof Plan – Electrical Services Layout
R621 – 005E	Lecture Hall Ground Floor - Power & ICT Layout
R621 – 006E	Lecture Hall Ground Floor - Lighting Layout
R621 – 007E	Lecture Hall First Floor - Power & ICT Layout
R621 – 008E	Lecture Hall First Floor - Lighting Layout
R621 – 009E	Lecture Hall Roof Plan – Electrical Services Layout
R621 – 010E	Restaurant Ground Floor - Power & ICT Layout
R621 – 011E	Restaurant Ground Floor - Lighting Layout
R621 – 012E	Restaurant Roof Plan – Electrical Services Layout
R621 – 013E	Workshops Ground Floor - Power & ICT Layout
R621 – 014E	Workshops Ground Floor - Lighting Layout
R621 – 015E	Workshops Roof Plan – Electrical Services Layout
R621 – 016E	Acua Centre Ground Floor - Power & ICT Layout
R621 – 017E	Acua Centre Ground Floor - Lighting Layout
R621 – 018E	Acua Centre Roof Plan – Electrical Services Layout
R621 – 019E	Power House – Electrical Services Layout
R621 – 020E	Guard House – Electrical Services Layout
R621 – 021E	Electrical Schematic

PARTICULAR SPECIFICATIONS

OF

MATERIALS AND WORKS

PARTICULAR SPECIFICATIONS

1.0 SITE LOCATION

The site of the proposed works is located at Kisumu Polytechnic, Kisumu County.

2.0 SCOPE OF WORKS

The works to be carried out under this sub-contract comprise supply, installation, testing and commissioning of the following:-

a) Lighting Fittings

b) Electrical accessories (switches, sockets, telephone plates etc)

c) Conduit works

d) Cabling

e) Trunking

3.0 MATERIALS FOR THE WORKS

Materials shall be as specified in Section D and in the Bills of Quantities of this document which shall be read in conjunction with contract drawings. The works shall be of high quality and standards, and the Sub-contractor shall be required to submit samples of materials for approval by the engineer before he commences the carrying out of the works. Alternative materials shall be accepted only after approval by the Electrical Engineer.

4.0 CO-ORDINATION WITH OTHER CONTRACTORS

The sub-contractor is requested, when carrying out his works, to properly co-ordinate with other Contractors who shall be in the same site carrying out other works.

SECTION K

BILLS OF QUANTITIES

SPECIAL NOTES

1. The Bills of Quantities form part of the contract documents and are to be read in conjunction with the contract drawings and general specifications of materials and works.

2 All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part thereof.

3. The brief description of the items given in the Bills of Quantities are for the purpose of establishing a standard to which the sub-contractor shall adhere. Otherwise, alternative brands of **equal** and **approved** quality will be accepted.

4. Should the sub-contractor install any material not specified here in before receiving **written approva**l from the Project Manager, the sub-contractor shall remove the material in question and, **at his own cost**, install the proper material.

5. The grand total of prices in the price summary page must be carried forward to the **Form of Tender for the tender to be deemed valid**.

BILLS OF QUANTITIES

ELECTRICAL WORKS

SECTION: 1-COMMON AREA

ITEM	DESCRIPTION	UNIT	QTY	RATE	KSHS
	SECTION: 1.2.0				
	TITLE: 2.1 INCOMING POWER SUPPLY				
1.2.1	**Incoming power supply**				
1.2.1	Allow a provisional sum for the client contribution towards K.P.&L.C upgrade, its associated accessories and connection charges	Sum	1		**3,000,000.00**
1.2.2	Allow for attendance to K.P.&L.C	Item	1		
1.2.3	200mm diameter Heavy gauge duct for incoming underground H.V. cables with 1:3:6 concrete surround, include digging, laying & backfilling	LM	120		
1.2.4	900 x 900 x 900 concrete manhole complete with Manhole covers and Hatari (Danger) Sign indelibly engraved at the top	No	8		
1.2.5	Hatari (Danger) sign concerete slabs	No	60		
1.2.6	Any other item necessary to complete the installation in this section (state)	Item			
	Kisumu National Polytechnic-Common Area **Total carried forward to Summary page**	**SUM**			

ITEM	DESCRIPTION	UNIT	QTY	RATE	TOTAL (KSHS)
	SECTION: 1.3				
1.3.0	**TITLE: MAIN LV BOARD**				
1.3.1	Supply, install, test and commission Free standing, powder coated, oven baked main LV-board as follows:				
1.3.2	(Meter Board to be manufactured by specialized power systems) or equivalent and approved by the engineer.		1		
1.3.3	Digital multimeter capable of measuring voltage in the range 0 – 600V, 3-phase, current in the range 0-700A, 3-phase, and all power system parameters (KW, KVA, KWHr, KVArs, Frequency, P.F., harmonics and all the parameters). The multimeter to have an accessible terminal for connecting an external printer, and should be complete with selector switches for viewing/displaying the various parameters.	No.	1		
1.3.4	KPLC TPN cutouts and wiring	Item	1		
1.3.5	630A TPN Main KPLC Incomer MCCB	No.	1		
1.3.6	630A TPN Main Generator Incomer MCCB	No.	1		
1.3.7	630A AMF-Three Phase Triple Pole Changeover Switch with mechanically and electrically interlocked, changeover contactors	No.	1		
1.3.8	700A TPN copper sealable bus bars	Item	1		
1.3.9	Space for Three Phase KPLC meter	No.	1		
1.3.10	0-700A ammeter	No.	3		
1.3.11	0-600V Voltmeter	No.	3		
1.3.12	0-700A/5A Current transformer	No.	3		
1.3.13	5A protection MCBS	No.	6		
1.3.14	Phase Indicator Lamps	No.	6		
1.3.15	Clear Perspex windows for meter viewing and provision for padlocking	Item	1		
1.3.16	150A TPN MCCB for Power Factor Correction	No.	1		
1.3.17	125A TPN outgoing MCCBs For Restaurant	No.	1		
1.3.18	125A TPN outgoing MCCBs For Lecture Hall	No.	1		
1.3.19	150A TPN outgoing MCCBs For Visitors' Center & Acua Centre	No.	1		
1.3.20	100A TPN outgoing MCCBs For Admin Block	No.	1		
1.3.21	80A TPN outgoing MCCBs For Workshops	No.	2		
1.3.22	63A TPN outgoing MCCBs For Street Lighting DB	No.	2		
1.3.23	63A DP outgoing MCBs For Guard House CU	No.	1		
1.3.24	63A DP outgoing MCBs For Power House CU	No.	1		
1.3.25	Spare ways for Single Phase circuits for future development.	No.	6		
1.3.26	Fire man's switch Installation & Accessories	Item	1		
	Kisumu National Polytechnic-Common Area **Total carried forward to the next page**	**SUM**			

ITEM	DESCRIPTION	UNIT	QTY	RATE	TOTAL (KSHS)
	Total B/F from Previous Page	**SUM**			
1.3.27	Inter - wiring of all accessories to satisfactory operation of the meter board	Item	1		
1.3.28	415V three-phase surge diverter as Furse ESP 415, wired as shown, complete with enclosure with viewing window.	Item	1		
1.3.29	100 KVArs digital programmed modular type automatic power factor correction capacitor bank switched in 2 steps of 2.5 KVArs, 3 steps of 5 KVArs, 1 steps of 10 KVArs, 1 steps of 20 KVArs and 1 steps of 50 KVArs complete with alarm for low power factor, switching MCBs, contactor controls and interwiring to facilitate dropping out of the capacitor bank in the event of mains power failure to avoid disorienting the generator AVR modules.	Item	1		-
1.3.30	Allow for cable glands/fixing/suspending accessories & all other Inter - wiring requirements to satisfactory operation of the LV-Board System.	Item	1		
1.3.31	Any other item necessary to complete the installation in this section (state)	Sum	1		
	Kisumu National Polytechnic-Common Area **Total carried forward to the next page**	**SUM**			

	SECTION: 1.4.0				
	TITLE: EARTHING SYSTEM				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Total B/F from Previous Page	**SUM**			
	Earthing for the LV-Board				
1.3.32	Earthing for the Main LV-Board under this section comprising 25x3mm copper tape lead, 1800mm long x 15mm diameter copper earth electrode as Furse or approved equivalent complete with Earth Terminal bars in Switch Room, driving stud and tape to rod clamp, 300mm x 300mm x 300mm deep concrete inspection earth pit with removable waterproof cover, 800mm x 800mm copper earth mat, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms and all other necessary accessories	Item	1		
	Earthing of Generator				-
1.3.33	Earthing for the Standby Generators comprising 11800mm long x 15mm diameter copper earth electrode, 800mm x 800mm copper earth mat complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms. Earthing cable of 25m length and all other necessary accessories	Item	1		
	Earthing of KPLC Transformer				
1.3.34	Earthing for the switch-board under this section comprising 25x3mm copper tape lead, 1800mm long x 15mm diameter copper earth electrode as Furse or approved equivalent complete with driving stud and tape to rod clamp, 300mm x 300mm x 300mm deep concrete inspection earth pit with removable waterproof cover, 800mm x 800mm copper earth mat, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 1-Ohms and all other necessary accessories	Item	1		
1.3.35	Any other item necessary to complete the installation in this section (state)	Sum	1		
	Kisumu National Polytechnic-Common Area Total Carried Forward to Summary Page	**SUM**			

	SECTION: 1.4.0				
	TITLE: POWER SUPPLY & RETICULATION				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following items complete as specified:				
1.4.0	**External Power Reticulation**				
1.4.1	100mm diameter PVC duct for Power cables with 1:3:6 concrete surround,	LM.	700		
1.4.2	75mm diameter PVC duct for ICT cables with 1:3:6 concrete surround,	LM.	700		
1.4.3	Digging, Laying and back filling of item 2.5.1 & 2.5.2 above	LM.	700		
1.4.4	300mm x 50mm cable trays complete with brackets.	LM.	30		
1.4.5	450x450x600mm Power and Data Manholes complete with covers to K.P.L.C and Telkom Standards and approval	No.	28		
					-
1.4.6	35mm² 4C CU/XLPE/PVC from Main LV Board to the Admin Block	LM.	180		
1.4.7	50mm² 4C CU/XLPE/PVC from Main LV Board to the Lecture Hall	LM.	150		
1.4.8	50mm² 4C CU/XLPE/PVC from Main LV Board to the Restaurant	LM.	200		
1.4.9	25mm² 4C CU/XLPE/PVC from Main LV Board to the Visitors Center	LM.	200		
1.4.10	25mm² 4C CU/XLPE/PVC from Main LV Board to the Acua Centre	LM.	200		
1.4.11	25mm² 4C CU/XLPE/PVC from Main LV Board to the Workshops	LM.	200		
1.4.12	10mm² 4C CU/XLPE/PVC from DB Recirculation Pump	LM.	180		
1.4.12	16mm² 2C CU/XLPE/PVC from Main LV Board to the Guard House	LM.	160		
					-
1.4.13	6mm² 2C CU/XLPE/PVC from Guard House to the Refuse	LM.	60		
1.4.14	Any other item necessary to complete the installation in this section (state)	Sum			
	Kisumu National Polytechnic - Common Area Total carried forward to summary page	**SUM**			

	SECTION: 1.5				
	TITLE: External Security Lighting				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following items complete as specified:				
1.5.0	**External Security Lighting**				
1.5.1	2N. 50mm diameter PVC duct for ICT cables with 1:3:6 concrete surround,	LM.	200		
1.5.2	Digging, Laying and back filling of item 2.5.1 & 2.5.2 above	LM.	200		
1.5.3	300mm x 50mm cable trays complete with brackets.	LM.	12		
1.5.4	Supply and Install 4.0 sqmm 2core PVC/SWA/PVC Cu cable drawn in conduits from Common area DB/CU to Up-Garden lights, bollards lights	LM.	300		
1.5.5	450x450x600mm Power and Data Manholes complete with covers to K.P.L.C and Telkom Standards and approval.	No.	14		
1.5.6	Supply and Install 2No.100watt 4000k Solar Street light complete with 6M GSM with 2NO. 1.5M Long Arms, streetlight, 4.5V 16W, Polycrystalline Solar Panel, LiFePO4 3.2V 24AH Batter. Excavation of the hole about 800mm deep with radius of 600mm. Cast with class 20 concrete reinforced.	Item	30		
1.5.7	Any other item necessary to complete the installation in this section (state)	Sum			
	Kisumu National Polytechnic-Common Area **Total carried forward to summary page**	**SUM**			

	SECTION: 1.6.0				
	TITLE: SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
1.6.0	**Summary Page**				
1.6.1	Total for Incoming KPLC Power				
1.6.2	Total for LV-Board & Earthing				
1.6.3	Total for Power Reticulation				
1.6.4	Total for External Security Lighting				
	Kisumu National Polytechnic-Common Area Total C/F to Main Electrical Summary Page	**SUM**			

SECTION: 2 -ADMINISTRATION BLOCK

	TITLE: ELECTRICAL POWER DISTRIBUTION				
Item	**Description**	**Unit**	**Qty**	**Rate**	**Total (Kshs)**
	Supply, Install, Test and Commission the Following Items Complete as Specified:				
2.1.0	**GROUND FLOOR**				
2.1.1	8 ways distribution board complete with 125 Amp integral as Schneider or equal and approved	No.	2		
2.1.2	6 ways distribution board complete with 125 Amp integral for Clean Power DB as Schneider or equal and approved	No.	2		
2.1.3	5 x 16mm² SC Submains cables	Lm.	100		
2.1.4	38mm Diameter hg PVC conduits for DB submains cables	Lm.	100		
2.1.5	5A - 60A SPN MCBS	No.	50		
2.1.6	63A TPN Main MCCB for DBs	No.	3		
2.1.7	Blanking plates for the spare ways	No.	10		
2.1.8	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	4		
2.1.9	**The following Power points**				
a)	Washrooms extract fan power points complete with connection unit wired by 30 meters of 3 x4.0mm² SC cables drawn in 25mm PVC conduit.	No.	4		
b)	Air - Conditioning units power point complete with connection unit wired by 10meters of 3 x 4.0	No.	12		
	Earthing of DB				
2.1.10	Earthing for the Distribution Board comprising 11800mm long x 15mm diameter copper earth electrode, complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms. Earthing cable of 6m length and all other necessary accessories	Item	1		
2.1.11	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/11			

	SECTION: 2.2 TITLE: LIGHTING AND SMALL POWER-CONDUITS & WIRING				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
2.2.0	**GROUND FLOOR**				
2.2.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	180		
2.2.2	Supply and install Signage Power points wired by 3x1.5mm² SC cables drawn in 20mm diameter concealed HG PVC conduit excluding the switch.	No.	4		
2.2.3	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	150		
2.2.4	Ditto but wired by 2.5mm² TWE sheathed cable	No.	30		
2.2.5	250 x 50mm 3 compartment oven baked metal trunking complete with bends	Lm.	150		
2.2.6	Single trunking plates	No.	30		
2.2.7	Twin trunking plates	No.	80		
2.2.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/12			

	SECTION: 2.3 TITLE: LIGHTING AND SMALL POWER -FITTINGS & ACCESSORIES				
Item	**Description**	**Unit**	**Qty**	**Rate**	**Total (Kshs)**
	Supply, install, test and commission the following:				
2.3.0	**GROUND FLOOR**				
2.3.1	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	20		
	1 way 2 gang	No.	14		
	2 way 1 gang	No.	12		
	2 way 2 gang	No.	14		
	2way 3 gang Switch bank	No.	4		
	Intermediate Switch	No.	1		
2.3.2	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type 2J -36W, 0.9 P.F. 600x600mm fully recessed 105Lm/W LED back lit panel light fitting as Osram, LEDVANCE, Robus, V-Tac, or equal and approved.	No.	40		
	Type L1- 50mm LED Ceiling recessed light	No.	10		
	Type L2- 120mm LED Ceiling recessed light	No.	2		
	Type L3- 200mm LED Ceiling recessed light	No.	18		
	Type D - LED 200mm surface mounted fitting	No.	34		
	Type Q-Bulkhead fitting	No.	18		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	12		
	Type M - LED 200mm ceiling mounted fitting for Washrooms.	No.	28		
	Type V - 1200 x 36W mirror light as thorn	No.	6		
	Type K - 600mm Mirror light with inbuilt switch .	No.	4		
2.3.3	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	50		
	Ditto but with USB & Type C Ports	No.	20		
	Ditto but for clean power (Non - standard)	No.	40		
	20A DP switch	No.	14		
2.3.4	Floor box accommodating 4No. Twin Socket and 4No. Dual outlet plates	No.	7		
2.3.5	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/13			

	SECTION: 2.4				
	TITLE: T.V, DATA AND SPECIALIST ITEMS CONDUITS				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
2.4.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	80		
2.4.2	Ditto but for WIFI	No.	14		
2.4.3	Ditto but for CCTV	No.	40		
2.4.4	Ditto but for Access Control	No.	12		
2.4.5	Ditto but for Wall Mounted Speaker Connections.	No.	12		
2.4.6	38mm diameter heavy gauge PVC conduit	LM	200		
2.4.7	300mm x 300mm Cable Loop-In Box	No.	2		
2.4.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/14			

	SECTION: 2.5.0				
	TITLE: FIRE ALARM SYSTEM				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
2.5	**FIRE ALARM SYSTEM**				
	Supply, install, test and commission the following:				
2.5.1	Fire alarm point wired by 1.5mm² 3 core heat resistant cables as FP200 drawn in concealed PVC conduit.	No.	58		
2.5.2	Addressable smoke detectors as Menvier or approved equivalent	No.	16		
2.5.3	Addressable Heat Detector as Menvier or approved equivalent	No.	4		
2.5.4	Addressable fire alarm sounder complete with beacon light as MENVIER or approved equivalent	No.	5		
2.5.5	Addressable fire alarm break glass points as Menvier or it's approved equivalent	No.	5		
2.5.6	Emergency exit signs with 3 hour-maintained lamps. Complete wiring	No.	8		
2.5.7	1 Zone addressable control panel as menvier complete with wiring and labeling or its approved equivalent	No.	1		
2.5.8	Any other item necessary to complete the installation (state)	Sum			-
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/15			

	SECTION: 2.6.0				
Item	**Description**	**Unit**	**Qty**	**Rate**	**Total (Kshs)**
2.6.0	**<u>Lightning Protection</u>**				
2.6.1	Air terminations properly fastened onto the roof	No.	4		
2.6.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	100		
2.6.3	Copper saddles	No.	100		
2.6.4	Copper to earth rod junction clamps	No.	4		
2.6.5	Copper to copper clamps	No.	4		
2.6.6	Test clamp	No.	4		
2.6.7	1500mm long copper earth rod	No.	4		
2.6.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/16			

	SECTION: 2.7.0				
	TITLE: UNINTERRUPTABLE POWER SUPPLY (UPS)				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, Install, Test and Commission the following;				
2.7.1	Shield Smart 30KVA Smart Online Double Conversion tower UPS with LCD/LED Display. Wide Input Voltage. 1.0 Power Factor. Optional Network Card. Complete with the network module for remote Monitoring & Network Management. and at least 30min runtime at full load and support external batteries storage for more Runtime. or equal and approved	No.	60		
2.7.2	63A TPN manual by-pass system for the UPS board comprising 63A TPN manual change-over switch, in enclosure made from powder coated galvanized steel sheets	Item	1		
2.7.3	5x16 mm2 SC cables from the Inverter to CU	LM	30		
2.7.4	Any other item necessary for completion of the installation in this section (state)				
	Kisumu National Polytechnic-Admin Block **Total carried forward to summary page**	**SUM**			
		K/17			

	SECTION: 2.8.0				
	TITLE: SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
2.8.0	**Admin Block Summary Page**				
2.8.1	Total for Internal Electrical power distribution				
2.8.2	Total for Lighting and small power -Conduits & Wiring				
2.8.3	Total for Lighting and small power -Fittings & Accessories				
2.8.4	Total for Specialist Items CCTV, Data outlet plates & conduits				
2.8.5	Total for Fire Alarm Installation				
2.8.6	Total for Lightning protection				
2.8.7	Total for Uninterruptable Power Supply (UPS)				
	Kisumu National Polytechnic-Admin Block Total C/F to Main Electrical Summary Page	**SUM**			

SECTION: 3 - LECTURE HALL

	TITLE: ELECTRICAL POWER DISTRIBUTION				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Supply, install, test and commission the following items complete as specified:				
3.1.0	**GROUND FLOOR**				
3.1.1	10 ways distribution board complete with 160 Amp integral as Schneider or equal and approved	No.	1		
3.1.2	6 ways distribution board complete with 125 Amp integral for Clean Power DB as Schneider or equal and approved	No.	1		
3.1.3	5 x 16mm² SC Submains cables to DBs	Lm.	60		
3.1.4	5 x 25mm² SC Submains cables to Solar Inverter & then to DB	Lm.	40		
3.1.5	38mm Diameter hg PVC conduits for DB submains cables	Lm.	100		
3.1.6	5A - 60A SPN MCBS	No.	50		
3.1.7	63A TPN Main MCCB for DBs	No.	2		
3.1.8	Blanking plates for the spare ways	No.	10		
3.1.9	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	4		
3.1.10	**The following Power points**				
a)	AHU power points complete with connection unit wired by 60 meters of 10.0mm² 5C cables drawn in 32mm PVC conduit.	No.	1		
b)	Washrooms extract fan power points complete with connection unit wired by 30 meters of 3 x 4.0mm² SC cables drawn in 25mm PVC conduit.	No.	4		
c)	Air - Conditioning units power point complete with connection unit wired by 10meters of 3 x 4.0mm² SC cables drawn in 25mm PVC conduit.	No.	12		
	Earthing of DB				
3.1.11	Earthing for the Distribution Board comprising 11800mm long x 15mm diameter copper earth electrode, complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms. Earthing cable of 6m length and all other necessary accessories	Item	1		
3.1.12	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall **Total carried forward to the Next page**	**SUM**			
		K/19			

SECTION: 3.2

	TITLE: ELECTRICAL POWER DISTRIBUTION				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Supply, install, test and commission the following items complete as specified:				
	Total B/F from Previous Page				
3.2.0	**FIRST FLOOR**				
3.2.1	8 ways distribution board complete with 125 Amp integral for Bank Raw Power DB as Schneider or equal and approved	No.	2		
3.2.2	6 ways distribution board complete with 125 Amp integral for Bank Clean Power DB as Schneider or equal and approved	No.	2		
3.2.3	5 x 16mm² SC Submains cables	Lm.	120		
3.2.4	38mm Diameter hg PVC conduits for DB submains cables	Lm.	120		
3.2.5	5A - 60A SPN MCBS	No.	50		
3.2.6	63A TPN Main MCCB for DBs	No.	3		
3.2.7	Blanking plates for the spare ways	No.	10		
3.2.8	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	4		
3.2.9	**The following Power points**				
b)	Washrooms extract fan power points complete with connection unit wired by 30 meters of 3 x4.0mm² SC cables drawn in 25mm PVC conduit.	No.	4		
c)	Air - Conditioning units power point complete with connection unit wired by 10meters of 3 x 4.0mm² SC cables drawn in 25mm PVC conduit.	No.	8		
3.2.10	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu Polytechnic-Lecture Hall **Total carried forward to summary page**	**SUM**			
		K/20			

	SECTION: 3.3 TITLE: LIGHTING AND SMALL POWER - CONDUITS & WIRING				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Supply, Install, Test and Commission the Following:				
3.3.0	**GROUND FLOOR**				
3.3.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	160		
3.3.2	Supply and install Signage Power points wired by 3x1.5mm² SC cables drawn in 20mm diameter concealed HG PVC conduit excluding the switch.	No.	4		
3.3.3	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	100		
3.3.4	Ditto but wired by 2.5mm² TWE sheathed cable	No.	40		
3.3.5	250 x 50mm 3 compartment oven baked metal Trunking complete with bends	Lm.	140		
3.3.6	Single Trunking plates	No.	30		
3.3.7	Twin Trunking plates	No.	80		
3.3.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall Total carried forward to the Next page	**SUM**			

	SECTION: 3.5 TITLE: LIGHTING AND SMALL POWER-CONDUITS & WIRING				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
	Total B/F from Previous Page				
	Supply, install, test and commission the following:				
3.5.0	**FIRST FLOOR**				
3.5.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	160		
3.5.2	Supply and install Signage Power points wired by 3x1.5mm² SC cables drawn in 20mm diameter concealed HG PVC conduit excluding the switch.	No.	4		
3.5.3	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	80		
3.5.4	Ditto but wired by 2.5mm² TWE sheathed cable	No.	30		
3.5.5	250 x 50mm 3 compartment oven baked metal trunking complete with bends	Lm.	120		
3.5.6	Single trunking plates	No.	30		
3.5.7	Twin trunking plates	No.	80		
3.5.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall **Total carried forward to collection page**	**SUM**			

	SECTION: 3.6 TITLE: LIGHTING AND SMALL POWER -FITTINGS & ACCESSORIES				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Supply, install, test and commission the following:				
3.6.0	**GROUND FLOOR**				
3.6.1	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	20		
	1 way 2 gang	No.	14		
	2 way 1 gang	No.	12		
	2 way 2 gang	No.	14		
	2way 3 gang Switch bank	No.	4		
	Intermediate Switch	No.	1		
3.6.2	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type 2J -36W, 0.9 P.F. 600x600mm fully recessed 105Lm/W LED back lit panel light fitting as Osram, LEDVANCE, Robus, V-Tac, or equal and approved.	No.	28		
	Type Hb- 100W LED Dimmable multicolour High Bay Light	No.	26		
	Type L1- 50mm LED Ceiling recessed light	No.	10		
	Type L2- 120mm LED Ceiling recessed light	No.	2		
	Type L3- 200mm LED Ceiling recessed light	No.	18		
	Type D - LED 200mm surface mounted fitting	No.	8		
	Type Q-Bulkhead fitting	No.	12		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	8		
	Type M - LED 200mm ceiling mounted fitting for Washrooms.	No.	16		
	Type V - 1200 x 36W mirror light as thorn	No.	6		
	Type K - 600mm Mirror light with inbuilt switch.	No.	4		
3.6.3	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	50		
	Ditto but with USB & Type C Ports	No.	20		
	Ditto but for clean power (non-standard)	No.	40		
	20A DP switch	No.	14		
3.6.4	Floor box accommodating 4No. Twin Socket and 4No. Dual outlet plates	No.	8		
3.6.5	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall **Total carried forward to the next page**	**SUM**			

	SECTION: 3.7 TITLE: LIGHTING AND SMALL POWER -FITTINGS & ACCESSORIES				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Total B/F from Previous Page				
	Supply, install, test and commission the following:				
3.7.0	**FIRST FLOOR**				
3.7.1	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	20		
	1 way 2 gang	No.	14		
	2 way 1 gang	No.	12		
	2 way 2 gang	No.	14		
	2way 3 gang Switch bank	No.	4		
	Intermediate Switch	No.	1		
3.7.2	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type 2J -36W, 0.9 P.F. 600x600mm fully recessed 105Lm/W LED back lit panel light fitting as Osram, LEDVANCE, Robus, V-Tac, or equal and approved.	No.	14		
	Type L2- 120mm LED Ceiling recessed light	No.	2		
	Type L3- 200mm LED Ceiling recessed light	No.	28		
	Type D - LED 200mm surface mounted fitting	No.	8		
3.7.3	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	50		
	Ditto but with USB & Type C Ports	No.	8		
	Ditto but for clean power (Non - standard)	No.	30		
	20A DP switch	No.	14		
3.7.4	Floor box accommodating 4No. Twin Socket and 4No. Dual outlet plates	No.	12		
3.7.5	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall **Total carried forward to collection page**	**SUM**			

	SECTION 3.8: T.V, DATA AND SPECIALIST ITEMS CONDUITS				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
	Supply, install, test and commission the following:				
3.8.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	80		
3.8.2	Ditto but for WIFI	No.	8		
3.8.3	Ditto but for CCTV	No.	50		
3.8.4	Ditto but for Access Control	No.	12		
3.8.5	Ditto but for Wall Mounted Speaker Connections.	No.	12		
3.8.6	38mm diameter heavy gauge PVC conduit	LM	400		
3.8.7	300mm x 300mm Cable Loop-In Box	No.	6		
3.8.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall **Total carried forward to summary page**	**SUM**			
		K/25			

	SECTION: 3.9 FIRE ALARM SYSTEM				
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Total (Kshs)**
3.9	**FIRE ALARM SYSTEM**				
	Supply, install, test and commission the following:				
3.9.1	Fire alarm point wired by 1.5mm² 3 core heat resistant cables as FP200 drawn in concealed PVC conduit.	No.	72		
3.9.2	Addressable smoke detectors as Menvier or approved equivalent	No.	30		
3.9.3	Addressable Heat Detector as Menvier or approved equivalent	No.	4		
3.9.4	Addressable fire alarm sounder complete with beacon light as MENVIER or approved equivalent	No.	5		
3.9.5	Addressable fire alarm break glass points as Menvier or it's approved equivalent	No.	5		
3.9.6	Emergency exit signs with 3 hour-maintained lamps. Complete wiring	No.	8		
3.9.7	1 Zone addressable control panel as menvier complete with wiring and labeling or its approved equivalent	No.	1		
3.9.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall Total carried forward to summary page	**SUM**			
		K/26			

	SECTION: 3.10				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
3.10.0	**<u>Lightning Protection</u>**				
3.10.1	Air terminations properly fastened onto the roof	No.	2		
3.10.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	80		
3.10.3	Copper saddles	No.	80		
3.10.4	Copper to earth rod junction clamps	No.	2		
3.10.5	Copper to copper clamps	No.	2		
3.10.6	Test clamp	No.	2		
3.10.7	1500mm long copper earth rod	No.	2		
3.10.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Lecture Hall **Total carried forward to summary page**	**SUM**			
		K/27			

	SECTION: 3.10				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
	Lecture Hall Summary Page				
3.11.1	Total for Internal Electrical power distribution				
3.11.2	Total for Lighting and small power -Conduits & Wiring				
3.11.3	Total for Lighting and small power -Fittings & Accessories				
3.11.4	Total for Specialist Items CCTV, Data outlet plates & conduits				
3.11.5	Total for Fire Alarm				
3.11.6	Total for Lightning protection				
	Kisumu National Polytechnic-Lecture Hall Total C/F to Main Electrical Summary Page	**SUM**			

SECTION 4: RESTAURANT

	SECTION: 4.1 ELECTRICAL POWER DISTRIBUTION				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following items complete as specified:				
4.1.0	**GROUND FLOOR**				
4.1.1	8 ways distribution board complete with 125 Amp integral as Schneider or equal and approved	No.	1		
4.1.2	6 ways distribution board complete with 125 Amp integral for Clean Power DB as Schneider or equal and approved	No.	1		
4.1.3	5 x 25mm² SC Submains cables	Lm.	50		
4.1.4	5 x 16mm² SC Submains cables	Lm.	40		
4.1.5	38mm Diameter hg PVC conduits for DB submains cables	Lm.	90		
4.1.6	5A - 60A SPN MCBS	No.	40		
4.1.7	10A - 60A TPN MCBS	No.	8		
4.1.8	63A TPN Main MCCB for DBs	No.	3		
4.1.9	Blanking plates for the spare ways	No.	2		
4.1.10	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	2		
4.1.11	**The following Power points**				
a)	Kitchen Extraction fan power points complete with connection unit wired by 30 meters of 5 x 6.0mm² SC cables drawn in 32mm PVC conduit.	No.	2		
b)	Kitchen Equipment's (3ph) power points complete with connection unit wired by 20 meters of 5 x 6.0mm² SC cables drawn in 32mm PVC conduit.	No.	6		
c)	Kitchen Equipment's (1ph) power points complete with connection unit wired by 20 meters of 3 x 6.0mm² SC cables drawn in 25mm PVC conduit.	No.	10		
d)	Washrooms extract fan/Air - Conditioning unit power points complete with connection unit wired by 30 meters of 3 x 4.0mm² SC cables drawn in 25mm PVC conduit.	No.	4		
	Earthing of DB				
4.1.12	Earthing for the Distribution Board comprising 11800mm long x 15mm diameter copper earth electrode, complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms. Earthing cable of 6m length and all other necessary accessories	Item	1		
4.1.13	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic- Restaurant **Total carried forward to summary page**	**SUM**			
		K/30			

	SECTION: 4.2 TITLE: LIGHTING AND SMALL POWER-CONDUITS & WIRING				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
4.2.0	**GROUND FLOOR**				
4.2.1	Lighting points wired by 3 x 1.5 mm^2 SC cables drawn in 20mm diameter concealed PVC conduit.	No.	100		
4.2.2	Supply and install Signage Power points wired by 3x1.5mm^2 SC cables drawn in 20mm diameter concealed HG PVC conduit excluding the switch.	No.	4		
4.2.3	Power points wired by 3 x 2.5mm^2 SC cables drawn in 20mm diameter conduit.	No.	120		
4.2.4	250 x 50mm 3 compartment oven baked metal trunking complete with bends	Lm.	20		
4.2.5	Single trunking plates	No.	10		
4.2.6	Twin trunking plates	No.	10		
4.2.7	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic- Restaurant **Total carried forward to summary page**	**SUM**			

	SECTION: 4.3 TITLE: LIGHTING AND SMALL POWER - FITTINGS & ACCESSORIES				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
4.3.0	**GROUND FLOOR**				
4.3.1	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	20		
	1 way 2 gang	No.	14		
	2 way 1 gang	No.	12		
	2 way 2 gang	No.	14		
	2way 3 gang Switch bank	No.	4		
	Intermediate Switch	No.	1		
4.3.2	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type P -20W Ceiling Mounted Decorative Pendant for lounge	No.	20		
	Type H-1200mm Fluorescent Weather Proof Fitting with frost free cover.	No.	12		
	Type L3- 200mm LED Ceiling recessed light	No.	2		
	Type D - LED 200mm surface mounted fitting	No.	4		
	Type Q-Bulkhead fitting	No.	20		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	4		
	Type M - LED 200mm ceiling mounted fitting for Washrooms.	No.	20		
	Type V - 1200 x 36W mirror light as thorn	No.	6		
	Type K - 600mm Mirror light with inbuilt switch .	No.	4		
4.3.3	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	40		
	Ditto but with USB & Type C Ports	No.	10		
	Ditto but for clean power (Non - standard)	No.	10		
	20Awhite moulded DP switch with neon light	No.	14		
	16 A twin switched socket outlets	No.	12		
	15A 3pin Industrial Sockets	No.	6		
	15A 5pin Industrial Sockets	No.	6		
	1ph isolator	No.	10		
	3ph isolator	No.	6		
4.3.4	Floor box accommodating 4No. Twin Socket and 4No. Dual outlet plates	No.	2		
4.3.5	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic- Restaurant **Total carried forward to summary page**	**SUM**			

	SECTION: 4.4 T.V, DATA AND SPECIALIST ITEMS CONDUITS				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
4.4.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	16		
4.4.2	Ditto but for WIFI	No.	2		
4.4.3	Ditto but for CCTV	No.	12		
4.4.4	32mm diameter heavy gauge PVC conduit	LM	160		
4.4.5	Solar PV Conduits from Roof Arae with Panels to Inverter Room 50mm diameter heavy gauge PVC conduit	LM	80		
4.4.6	300mm x 300mm Cable Loop-In Box	No.	2		
					-
					-
4.4.7	Any other item necessary to complete this installation in this section (state)	Sum			-
	Kisumu National Polytechnic- Restaurant **Total carried forward to summary page**	**SUM**			
		K/33			

	SECTION: 4.5 FIRE ALARM SYSTEM				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
4.5.0	**FIRE ALARM SYSTEM**				
	Supply, install, test and commission the following:				
4.5.1	Fire alarm point wired by 1.5mm² 3 core heat resistant cables as FP200 drawn in concealed PVC conduit.	No.	30		
4.5.2	Addressable smoke detectors as Menvier or approved equivalent	No.	8		
4.5.3	Addressable Heat Detector as Menvier or approved equivalent	No.	4		
4.5.4	Addressable fire alarm sounder complete with beacon light as MENVIER or approved equivalent	No.	2		
4.5.5	Addressable fire alarm break glass points as Menvier or it's approved equivalent	No.	2		
4.5.6	Emergency exit signs with 3 hour-maintained lamps. Complete wiring	No.	4		
4.5.7	1 Zone addressable control panel as menvier complete with wiring and labeling or its approved equivalent	No.	1		
4.5.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic- Restaurant **Total carried forward to summary page**	**SUM**			

	SECTION: 4.6				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
4.6	**Lightning Protection**				
4.6.1	Air terminations properly fastened onto the roof	No.	2		
4.6.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	80		
4.6.3	Copper saddles	No.	80		
4.6.4	Copper to earth rod junction clamps	No.	2		
4.6.5	Copper to copper clamps	No.	2		
4.6.6	Test clamp	No.	2		
4.6.7	1500mm long copper earth rod	No.	2		
4.6.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic- Restaurant **Total carried forward to summary page**	**SUM**			

SECTION: 4.7

	TITLE: SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTAL (KSHS)**
4.7.0	**Restaurant Summary Page**				
4.7.1	Total for Internal Electrical power distribution				
4.7.2	Total for Lighting and small power -Conduits & Wiring				
4.7.3	Total for Lighting and small power -Fittings & Accessories				
4.7.4	Total for Specialist Items CCTV, Data outlet plates & conduits				
4.7.5	Total for Fire Detection & Alarm				
4.7.6	Total for Lightning protection				
	Kisumu National Polytechnic-Restaurant **Total C/F to Main Electrical Summary Page**	**SUM**			

SECTION: 5 VISITORS CENTRE, MUSEUM AND AQUA CENTRE

	TITLE: ELECTRICAL POWER DISTRIBUTION				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
	Supply, install, test and commission the following items complete as specified:				
5.1.0	**GROUND FLOOR**				
5.1.1	12 ways main distribution board complete with 150 Amp integral for as Schneider or equal and approved	No.	1		
5.1.2	8 ways distribution board complete with 125 Amp integral for as Schneider or equal and approved	No.	2		
5.1.3	6 ways distribution board complete with 125 Amp integral for Clean Power DB as Schneider or equal and approved	No.	3		
5.1.4	5 x 16mm² SC Submains cables	Lm.	280		
5.1.5	38mm Diameter hg PVC conduits for DB submains cables	Lm.	280		
5.1.6	5A - 60A SPN MCBS	No.	80		
5.1.7	10A - 60A TPN MCBS	No.	4		
5.1.8	63A TPN Main MCCB for DBs	No.	5		
5.1.9	Blanking plates for the spare ways	No.	20		
5.1.10	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	6		
5.1.11	**The following Power points**				
a)	Washrooms extract fan power points complete with connection unit wired by 30 meters of 3 x 2.5mm² SC cables drawn in 25mm PVC conduit.	No.	20		
b)	Air - Conditioning units power point complete with connection unit wired by 10meters of 3 x 2.5mm² SC cables drawn in 25mm PVC conduit.	No.	20		
	Earthing of DB				
					-
5.1.13	Any other item necessary to complete this installation in this section (state)	Sum			-
	Kisumu National Polytechnic-Visitors' & Aqua Total carried forward to summary page	**SUM**			
		K/37			

	SECTION: 5.2 LIGHTING AND SMALL POWER-CONDUITS & WIRING				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
	Supply, install, test and commission the following:				
5.2.0	**GROUND FLOOR**				
5.2.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	260		
5.2.2	Supply and install Signage Power points wired by 3x1.5mm² SC cables drawn in 20mm diameter concealed HG PVC conduit excluding the switch.	No.	4		
5.2.3	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	180		
5.2.4	Ditto but wired by 2.5mm² TWE sheathed cable	No.	30		
5.2.5	250 x 50mm 3 compartment oven baked metal trunking complete with bends	Lm.	120		
5.2.6	Single trunking plates	No.	30		
5.2.7	Twin trunking plates	No.	80		
5.2.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Visitors' & Aqua **Total carried forward to summary page**	**SUM**			

	SECTION: 5.3 LIGHTING AND SMALL POWER -FITTINGS & ACCESSORIES				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
	Supply, install, test and commission the following:				
5.3.0	**GROUND FLOOR**				
5.3.1	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	20		
	1 way 2 gang	No.	14		
	2 way 1 gang	No.	12		
	2 way 2 gang	No.	14		
	2way 3 gang Switch bank	No.	4		
	Intermediate Switch	No.	1		
5.3.2	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type 2J -36W, 0.9 P.F. 600x600mm fully recessed 105Lm/W LED back lit panel light fitting as Osram, LEDVANCE, Robus, V-Tac, or equal and approved.	No.	40		
	Type L1- 50mm LED Ceiling recessed light	No.	30		
	Type L2- 120mm LED Ceiling recessed light	No.	2		
	Type L3- 200mm LED Ceiling recessed light	No.	18		
	Type D - LED 200mm surface mounted fitting	No.	60		
	Type Q-Bulkhead fitting	No.	28		
	Type X - Outdoor decorative Up & Down LED 2x6W wall bracket lights fitting.	No.	22		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	12		
	Type Z-Bollard light fittings 7watts as 3000k	No.	6		
	Type M - LED 200mm ceiling mounted fitting for Washrooms.	No.	28		
	Type V - 1200 x 36W mirror light as thorn	No.	6		
	Type K - 600mm Mirror light with inbuilt switch .	No.	4		
5.3.3	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	50		
	Ditto but with USB & Type C Ports	No.	20		
	Ditto but for clean power (Non - standard)	No.	40		
	20A DP switch	No.	14		
5.3.4	Floor box accommodating 4No. Twin Socket and 4No. Dual outlet plates	No.	7		
5.3.5	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Visitors' & Aqua **Total carried forward to summary page**	**SUM**			

	SECTION: 5.4 T.V, DATA AND SPECIALIST ITEMS CONDUITS				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
	Supply, install, test and commission the following:				
5.4.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	80		
5.4.2	Ditto but for WIFI	No.	14		
5.4.3	Ditto but for CCTV	No.	40		
5.4.4	Ditto but for Access Control	No.	12		
5.4.5	Ditto but for Wall Mounted Speaker Connections.	No.	12		
5.4.6	38mm diameter heavy gauge PVC conduit	LM	280		
5.4.7	300mm x 300mm Cable Loop-In Box	No.	4		
					-
5.4.8	Any other item necessary to complete this installation in this section (state)	Sum			-
	Kisumu National Polytechnic-Visitors' & Aqua Total carried forward to summary page	**SUM**			
		K/40			

	SECTION: 5.5 FIRE ALARM SYSTEM				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
5.5	**FIRE ALARM SYSTEM**				
	Supply, install, test and commission the following:				
5.5.1	Fire alarm point wired by 1.5mm² 3 core heat resistant cables as FP200 drawn in concealed PVC conduit.	No.	58		
5.5.2	Addressable smoke detectors as Menvier or approved equivalent	No.	16		
5.5.3	Addressable Heat Detector as Menvier or approved equivalent	No.	4		
5.5.4	Addressable fire alarm sounder complete with beacon light as MENVIER or approved equivalent	No.	5		
5.5.5	Addressable fire alarm break glass points as Menvier or it's approved equivalent	No.	5		
5.5.6	Emergency exit signs with 3 hour-maintained lamps. Complete wiring	No.	8		
5.5.7	1 Zone addressable control panel as menvier complete with wiring and labeling or its approved equivalent	No.	1		
5.5.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Visitors' & Aqua **Total carried forward to summary page**	**SUM**			
		K/41			

	SECTION: 5.6				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
5.6	**Lightning Protection**				
5.6.1	Air terminations properly fastened onto the roof	No.	6		
5.6.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	200		
5.6.3	Copper saddles	No.	200		
5.6.4	Copper to earth rod junction clamps	No.	6		
5.6.5	Copper to copper clamps	No.	6		
5.6.6	Test clamp	No.	6		
5.6.7	1500mm long copper earth rod	No.	6		
5.6.8	Any other item necessary to complete the installation (state)	Sum			-
	Kisumu National Polytechnic-Visitors' & Aqua **Total carried forward to summary page**	**SUM**			
		K/42			

	SECTION: 5.7				
	Acua Centre & Visitors' Center Summary Page				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE (KSHS)**	**TOTALS (KSHS)**
5.7.1	Total for Internal Electrical power distribution				
5.7.2	Total for Lighting and small power -Conduits & Wiring				
5.7.3	Total for Lighting and small power -Fittings & Accessories				
5.7.4	Total for Specialist Items CCTV, Data outlet plates & conduits				
5.7.5	Total for Fire Alarm				
5.7.6	Total for Lightning protection				
	Kisumu National Polytechnic-Visitors' & Aqua Total C/F to Main Electrical Summary Page	**SUM**			

SECTION 6.0: WORKSHOPS

	TITLE: ELECTRICAL POWER DISTRIBUTION				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**KSHS**
	Supply, install, test and commission the following items complete as specified:				
6.1.0	**GROUND FLOOR**				
6.1.1	10 ways distribution board complete with 125 Amp integral as Schneider or equal and approved	No.	1		
6.1.2	5 x 16mm² SC Submains cables	Lm.	30		
6.1.3	38mm Diameter hg PVC conduits for DB submains cables	Lm.	30		
6.1.4	5A - 60A SPN MCBS	No.	10		
6.1.5	10A - 60A TPN MCBS	No.	4		
6.1.6	63A TPN Main MCCB for DBs	No.	1		
6.1.7	Blanking plates for the spare ways	No.	2		
6.1.8	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	1		
6.1.9	**The following Power points**				
b)	3Ph power points complete with connection unit wired by 20 meters of 5 x 6.0mm² SC cables drawn in 32mm PVC conduit.	No.	6		
c)	1Ph power points complete with connection unit wired by 20 meters of 3 x 6.0mm² SC cables drawn in 25mm PVC conduit.	No.	8		
d)	Washrooms extract fan/Air - Conditioning unit power points complete with connection unit wired by 30 meters of 3 x 4.0mm² SC cables drawn in 25mm PVC conduit.	No.	4		
	Earthing of DB				
6.1.10	Earthing for the Distribution Board comprising 11800mm long x 15mm diameter copper earth electrode, complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms. Earthing cable of 6m length and all other necessary accessories	Item	1		
6.1.11	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Workshops **Total carried forward to Summary page**	**SUM**			
		K/44			

	SECTION: 6.2 TITLE: LIGHTING AND SMALL POWER-CONDUITS & WIRING				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
6.2.0	**GROUND FLOOR**				
6.2.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	20		
6.2.2	Supply and install Signage Power points wired by 3x1.5mm² SC cables drawn in 20mm diameter concealed HG PVC conduit excluding the switch.	No.	1		
6.2.3	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	14		
6.2.4	Power points wired by 3 x 4.0mm² SC cables drawn in 20mm diameter conduit.	No.	6		
6.2.5	Power points wired by 5 x 4.0mm² SC cables drawn in 20mm diameter conduit.	No.	4		
	Earthing of DB				
6.2.6	Earthing for the Distribution Board comprising 11800mm long x 15mm diameter copper earth electrode, complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc) necessary to achieve earthing value below 5-Ohms. Earthing cable of 6m length and all other necessary accessories	Item	1		
6.2.7	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Workshops **Total carried forward to Summary page**	**SUM**			

	SECTION: 6.3 TITLE: LIGHTING AND SMALL POWER -FITTINGS & ACCESSORIES				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
6.3.0	**GROUND FLOOR**				
6.3.1	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	4		
	1 way 2 gang	No.	4		
	2 way 1 gang	No.	2		
	2 way 2 gang	No.	2		
	2way 3 gang Switch bank	No.	0		
	Intermediate Switch	No.	0		
6.3.2	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type 2J -36W, 0.9 P.F. 600x600mm fully recessed 105Lm/W LED back lit panel light fitting as Osram, LEDVANCE, Robus, V-Tac, or equal and approved.	No.	2		
	Type B-1500mm Fluorescent Weather Proof Fitting with frost free cover.	No.	10		
	Type Q-Bulkhead fitting	No.	4		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	2		
6.3.3	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	15		
	Ditto but with USB & Type C Ports	No.	4		
	Ditto but for clean power (Non - standard)	No.	4		
	20A DP switch	No.	14		
	16A twin switched socket outets	No.	15		
	16A 3pin socket outets	No.	6		
	45A 5pin socket outets	No.	6		
	Single Phase Isolator	No.	8		
	Three Phase Isolator	No.	6		
6.3.4	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Workshops **Total carried forward to Summary page**	**SUM**			

	SECTION: 6.4 T.V, DATA AND SPECIALIST ITEMS CONDUITS				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
6.4.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	4		
6.4.2	Ditto but for WIFI	No.	1		
6.4.3	Ditto but for CCTV	No.	16		
6.4.4	38mm diameter heavy gauge PVC conduit	LM	100		
6.4.5	300mm x 300mm Cable Loop-In Box	No.	2		
6.4.6	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Workshops **Total carried forward to summary page**	**SUM**			
		K/47			

	SECTION: 6.5				
	TITLE: FIRE ALARM SYSTEM				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
6.5	**FIRE ALARM SYSTEM**				
	Supply, install, test and commission the following:				
6.5.1	Fire alarm point wired by 1.5mm² 3 core heat resistant cables as FP200 drawn in concealed PVC conduit.	No.	16		
6.5.2	Addressable smoke detectors as Menvier or approved equivalent	No.	6		
6.5.3	Addressable Heat Detector as Menvier or approved equivalent	No.	0		
6.5.4	Addressable fire alarm sounder complete with beacon light as MENVIER or approved equivalent	No.	1		
6.5.5	Addressable fire alarm break glass points as Menvier or it's approved equivalent	No.	2		
					-
6.5.6	Emergency exit signs with 3 hour-maintained lamps. Complete wiring	No.	2		
6.5.7	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Workshops **Total carried forward to summary page**	**SUM**			
		K/48			

	SECTION: 6.6				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL (KSHS)**
6.6	**Lightning Protection**				
6.6.1	Air terminations properly fastened onto the roof	No.	2		
6.6.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	60		
6.6.3	Copper saddles	No.	60		
6.6.4	Copper to earth rod junction clamps	No.	2		
6.6.5	Copper to copper clamps	No.	2		
6.6.6	Test clamp	No.	2		
6.6.7	1500mm long copper earth rod	No.	2		
6.6.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Workshops **Total carried forward to summary page**	**SUM**			
		K/49			

	SECTION: 6.7				
	TITLE: WORSHOPS-SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**KSHS**
6.7.1	Total for Internal Electrical power distribution				
6.7.2	Total for Lighting and small power -Conduits & Wiring				
6.7.3	Total for Lighting and small power -Fittings & Accessories				
6.7.4	Total for Specialist Items CCTV, Data outlet plates & conduits				
6.7.5	Total for Fire Alarm				
6.7.6	Total for Lightning protection				
	Total for 1No. Unit				
	Total for 2No. Units				
6.5.7	1 Zone addressable control panel as Menvier complete with wiring and labeling or its approved equivalent	No.	1		
	Kisumu National Polytechnic-Workshops **Total Carried Forward to Grand Total Page**	**SUM**			

SECTION 7.0: POWER HOUSE

	TITLE: ELECTRICAL POWER DISTRIBUTION				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following items complete as specified:				
7.1.0	**GROUND FLOOR**				
7.1.1	6 ways Consumer Unit complete with 63 Amp integral for as Schneider or equal and approved	No.	1		
7.1.2	6 ways distribution board complete with 63 Amp integral for Clean Power as Schneider or equal and approved	No.	1		
7.1.3	3 x 6mm² SC Submains cables	Lm.	20		
7.1.4	32mm Diameter hg PVC conduits for CU submains cables	Lm.	20		
7.1.5	5A - 60A SPN MCBS	No.	4		
7.1.6	Blanking plates for the spare ways	No.	2		
7.1.7	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	1		
7.1.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Power House **Total carried forward to summary page**	**SUM**			
		K/51			

	SECTION: 7.2 TITLE: LIGHTING AND SMALL POWER-CONDUITS & WIRING				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
7.2.0	**GROUND FLOOR**				
7.2.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	8		
7.2.2	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	3		
7.2.3	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	3		
	1 way 2 gang	No.	31		
7.2.4	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type B-1500mm Fluorescent Weather Proof Fitting with frost free cover.	No.	3		
	Type Q-Bulkhead fitting	No.	4		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	0		
7.2.5	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	3		
7.2.6	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Power House **Total carried forward to summary page**	**SUM**			

	SECTION: 7.3				
	TITLE: T.V, DATA AND SPECIALIST ITEMS CONDUITS				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
7.3.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	0		
7.3.2	Ditto but for WIFI	No.			
7.3.3	Ditto but for CCTV	No.	4		
7.3.4	38mm diameter heavy gauge PVC conduit	LM	20		
7.3.5	300mm x 300mm Cable Loop-In Box	No.	1		
7.3.6	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Power House **Total carried forward to summary page**	**SUM**			
		K/53			

	SECTION: 7.4				
	TITLE: FIRE ALARM SYSTEM				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
7.4	**FIRE ALARM SYSTEM**				
	Supply, install, test and commission the following:				
7.4.1	Fire alarm point wired by 1.5mm² 3 core heat resistant cables as FP200 drawn in concealed PVC conduit.	No.	3		
7.4.2	Addressable smoke detectors as Menvier or approved equivalent	No.	2		
7.4.3	Addressable Heat Detector as Menvier or approved equivalent	No.	2		
7.4.4	Addressable fire alarm sounder complete with beacon light as MENVIER or approved equivalent	No.	0		
7.4.5	Addressable fire alarm break glass points as Menvier or it's approved equivalent	No.	0		
7.4.6	Emergency exit signs with 3 hour-maintained lamps. Complete wiring	No.	2		
7.4.7	1 Zone addressable control panel as menvier complete with wiring and labeling or its approved equivalent	No.			
7.4.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Power House **Total carried forward to summary page**	**SUM**			
		K/54			

	SECTION: 7.5				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
7.5.0	**Lightning Protection**				
7.5.1	Air terminations properly fastened onto the roof	No.	1		
7.5.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	30		
7.5.3	Copper saddles	No.	30		
7.5.4	Copper to earth rod junction clamps	No.	1		
7.5.5	Copper to copper clamps	No.	1		
7.5.6	Test clamp	No.	1		
7.5.7	1500mm long copper earth rod	No.	1		
7.5.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Power House **Total carried forward to summary page**	**SUM**			
		K/55			

	SECTION: 7.6				
	TITLE: POWER HOUSE-SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
7.6.1	Total for Internal Electrical power distribution				
7.6.2	Total for Lighting and small power				
7.6.3	Total for Specialist Items CCTV, Data outlet plates & conduits				
7.6.4	Total for Fire Alarm				
7.6.5	Total for Lightning protection				
	Kisumu National Polytechnic-Power House Total C/F to Main Electrical Summary Page	**SUM**			
		K/56			

SECTION: 8 GUARD HOUSE

	TITLE: ELECTRICAL POWER DISTRIBUTION				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following items complete as specified:				
8.1.0	**GROUND FLOOR**				
8.1.1	6 ways Consumer Unit complete with 63 Amp integral for as Schneider or equal and approved	No.	1		
8.1.2	3 x 16mm² SC Submains cables	Lm.	20		
8.1.3	32mm Diameter hg PVC conduits for CU submains cables	Lm.	20		
8.1.4	5A - 60A SPN MCBS	No.	4		
8.1.5	Blanking plates for the spare ways	No.	2		
8.1.6	Carry out concise permanent traffolyte labeling for all the sub-circuits	Item	1		
	Earthing of CU				
8.1.7	Earthing for the Consumer Unit comprising 11800mm long x 15mm diameter copper earth electrode, complete with driving stud and tape to rod clamp as Furse or approved equivalent, 450mm x 450mm x 500mm deep concrete inspection earth pit with removable waterproof cover, soil conditioning agents (marconite and bentonite etc.) necessary to achieve earthing value below 5-Ohms. Earthing cable of 6m length and all other necessary accessories	Item	1		
8.1.8	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Guard House **Total carried forward to Summary page**	**SUM**			
		K/57			

ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
8.2.0	**GROUND FLOOR**				
8.2.1	Lighting points wired by 3 x 1.5 mm² SC cables drawn in 20mm diameter concealed PVC conduit.	No.	8		
8.2.2	Power points wired by 3 x 2.5mm² SC cables drawn in 20mm diameter conduit.	No.	4		
8.2.3	Lighting switches as Schneider or equal & approved.				
	1 way 1 gang	No.	2		
	1 way 2 gang	No.	2		
8.2.4	**The following types of lighting fittings as Panasonic, Philips or equal and approved**				
	Type 1-1500mm Fluorescent Weather Proof Fitting with frost free cover.	No.	1		
	Type Q-Bulkhead fitting	No.	4		
	Type FL- Flood Light with Motion Sensor 30W on wall or gate pillars.	No.	2		
8.2.5	The following outlet plates as MK or equal & approved				
	13A twin switched socket outets	No.	3		
8.2.6	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Guard House Total carried forward to Summary page	**SUM**			
		K/58			

	SECTION: 8.3				
	TITLE: T.V, DATA AND SPECIALIST ITEMS CONDUITS				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
	Supply, install, test and commission the following:				
8.3.1	Data outlet points comprising of 25mm diameter concealed heavy gauge PVC conduit, the outlet box and draw wire	No.	0		
8.3.2	Ditto but for WIFI	No.	1		
8.3.3	Ditto but for CCTV	No.	4		
8.3.4	38mm diameter heavy gauge PVC conduit	LM	20		
8.3.5	300mm x 300mm Cable Loop-In Box	No.	1		
8.3.6	Any other item necessary to complete this installation in this section (state)	Sum			
	Kisumu National Polytechnic-Guard House **Total carried forward to summary page**	**SUM**			
		K/59			

	SECTION: 8.4				
8.4	**<u>Lightning Protection</u>**				
8.4.1	Air terminations properly fastened onto the roof	No.	1		
8.4.2	3mmx25mm copper tape saddled appropriately at 1000mm intervals	Lm.	10		
8.4.3	Copper saddles	No.	10		
8.4.4	Copper to earth rod junction clamps	No.	1		
8.4.5	Copper to copper clamps	No.	1		
8.4.6	Test clamp	No.	1		
8.4.7	1500mm long copper earth rod	No.	1		
8.4.8	Any other item necessary to complete the installation (state)	Sum			
	Kisumu National Polytechnic-Guard House **Total carried forward to summary page**	**SUM**			
		K/60			

	SECTION: 8.5				
	TITLE: SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE(KSHS)**	**TOTAL (KSHS)**
8.5.0	**Guard House Summary Page**				
8.5.1	Total for Internal Electrical power distribution				
8.5.2	Total for Lighting and small power				
8.5.3	Total for Specialist Items CCTV, Data outlet plates & conduits				
8.5.4	Total for Lightning protection				
	Kisumu National Polytechnic - Guard House **Total C/F to Main Electrical Summary Page**	**SUM**			

BILLS OF QUANTITIES – ICT WORKS

SECTION: 9.0 ICT SCHEDULE

SECTION 9.1 – STRUCTURED CABLING WORKS

Item	Description	Unit	Qty	Rate	Kshs.
	Supply, Install, Test and Commission the following items:				
	HORIZONTAL CABLING				
9.1.1	CAT6A UTP 4-Pair cable as Giganet shielded/APC Shielded or approved equivalent drawn in the 25mm conduits/trunkings to wire both the data and voice points	LM	16780		
9.1.2	3m RJ45- RJ45 Cat 6A factory terminated patch cord as Siemon Cat No. ZM6A-03M-04 or equal and approved equivalent for use at workstation	No.	200		
9.1.3	3m RJ45- RJ11 Cat 6A factory terminated patch cord as Siemon Cat No. ZM6A-03M-04 or equal and approved equivalent for Telephone	No.	100		
9.1.4	0.5m/1m, RJ45- RJ45 Cat 6A factory terminated patch cord (grey/blue/red) as as Siemon Cat No. ZM6A-03M-04 or equal and approved equivalent to be used in cabinet.	No.	400		
9.1.5	RJ45 Cat 6A (Dual) Data/voice outlets complete with faceplates and labelling system as Giganet /APC or equal and approved equivalent	No.	200		
9.1.6	IDC (Insulation displacement connectors) – RJ45 1m patch cord jacks	No.	60		
	BACKBONE CABLING				
9.1.7	1000Base X 12-Core single mode fiber optic armored cable	LM	900		
9.1.8	24port Fibre ODF	No.	4		
9.1.9	24port Fibre Enclosure to intercept fiber	No.	5		
9.1.10	Fibre Optic Patch Leads	No.	6		
9.1.11	24 port data patch panel-Mettalic as Giganet/APC	No.	3		
9.1.12	SFP modules (single mode)	No.	12		
9.1.13	Installations accessories	lot	1		
	CABINETS				
9.1.14	9U cabinet low noise (low DB) fans and 1No. 6Ways PDU.	No.	2		
9.1.15	12U cabinet low noise (low DB) fans and 1No. 6Ways PDU.	No.	2		
9.1.16	16U cabinet low noise (low DB) fans and 1No. 6Ways PDU.	No.	3		
9.1.17	37U cabinet low noise (low DB) fans and 3No. 6Ways PDU.	No.	1		
9.1.18	Cable Mangers-Mettalic as Giganet/APC	Item	16		
	ACTIVE COMPONENTS				
9.1.19	24 port Core switch as Cico C9400 or equal and approved equivalent	No.	1		
9.1.20	48 port Switch as Cisco Catalyst 9200 48P, 4X 10G, network switch or an equal and approved equipment	No.	3		
9.1.21	24 port Switch as Cisco Catalyst 9200 24P, 4X 10G, network switch or an equal and approved equipment	No.	5		
9.1.22	WIFI Access Points long range as Ubiquiti UniFi-U7 Pro or equivalent and approved.	No.	15		
9.1.23	WIFI Access Points long range as Ubiquiti UniFi-U7 outdoor or equivalent and approved.	No.	2		
9.1.24	Earthing the entire system to engineer's approval	Lot	1		
9.1.25	Allow for the Configuration, Documentation and training entire System	Item	1		
9.1.26	Any other items that may be necessary as per your proposal. (list)	Item			
	Kisumu National Polytechnic-ICT **Total Carried Forward to Collection Page**	**SUM**			

SECTION 9.2 –CCTV SURVEILLANCE SYSTEM					
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**KSHS.**
	Supply, Deliver & Install				
9.2.1	CAT6A UTP 4-Pair cable as Giganet shielded/APC Shieleded or equal & approved equivalent.	Lm	15000		
9.2.2	CAT6A outdoor 4-Pair cable as Giganet shielded/APC Shieleded or equal & approved equivalent.	Lm	600		
9.2.3	IP Dome 4MP colour camera complete with all installation accessories as Hikvision or equal and approved	No	80		
9.2.4	IP bullet 4MP colour camera complete with all installation accessories as Hikvision or equal and approved	No	98		
9.2.5	24 port category 6A UTP patch panel as Giganet/APC	No	8		
9.2.6	1M RJ45-RJ45 Cat 6A UTP factory terminated patch cord as Siemon Cat No. BP6A-01M-02 or equal and approved equivalent to be used in cabinet.	No	170		
9.2.7	8 ports network Switch to Power the Cameras as Hikvision or equal and approved equivalent.	No	4		
9.2.8	16 ports network Switch to Power the Cameras as Hikvision or equal and approved equivalent.	No	4		
9.2.9	24 ports network Switch to Power the Cameras as Hikvision or equal and approved equivalent.	No	3		
9.2.10	48 ports network Switch to Power the Cameras as Hikvision or equal and approved equivalent.	No	2		
9.2.11	Network Video recorder- NVR 64 channel with AcuSense/Deep Vision support for face recognition and people counting, support up to 8MP as Hikvision/ProVision ISR or equal and approved equivalent.	No	4		
9.2.12	8TB Hard disk as Western Digital (WD) or equal and approved equivalent for NVRs above	No	8		
9.2.13	10m HDMI-HDMI High Speed Cable, 4K Resolution Support, Audio Return Channel	No	4		
9.2.14	CCTV Monitors as Hisense/Samsung / Sony UHD 4K smart TV 50" complete with wall brackets	No	4		
9.2.15	Allow for the Documentation, Training & Attending for Configuration	Sum			
9.2.16	Any other items necessary to complete the system installation satisfactorily (state).	Sum			
	Kisumu National Polytechnic-ICT **Total Carried Forward to Collection Page**	**SUM**			

SECTION 9.3: ICT-SUMMARY PAGE

ITEM	DESCRIPTION	UNIT	QTY	RATE	KSHS.
	Summary Page				
9.3.1	Total for Structured Cabling	Sum			
9.3.2	Total for CCTV Surveillance System	Sum			
	Kisumu National Polytechnic-ICT **Total Carried Forward to Main Electrical Summary Page**				
		K/64			

	SECTION 10.0: GRAND SUMMARY PAGE				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**KSHS**
10.0	**Electrical Installation Main Summary Page**				
10.1	Total for Common Services	Sum			
10.2	Total for Administration Building	Sum			
10.3	Total for Lecture Hall	Sum			
10.4	Total for Restaurant	Sum			
10.5	Total for Visitors' Center, Museum and Aqua Centre	Sum			
10.6	Total for Workshops	Sum			
10.7	Total for Power House	Sum			
10.8	Total for Gate House & Refuse	Sum			
10.9	Total for ICT Installation	Sum			
10.11	Allow for Preparation of Working drawings & As-Built Drawings and all the necessary printing.	Item			
	Kisumu Polytechnic -Main Electrical & ICT Page Total Carried Forward to Main Summary Page	**SUM**			

SECTION L

TECHNICAL SCHEDULE

OF

ITEMS TO BE SUPPLIED

TECHNICAL SCHEDULE

1.0 The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders

2.0 The filling of this schedule forms part of Technical Evaluation of the tenders, and bidders shall therefore be required to indicate the type/make and country of origin of all the materials and equipment's they intend to offer to the employer in this schedule.

3.0 Any bid returned with unfilled Technical Schedule shall be considered technically non-responsive, and the bidder shall automatically be disqualified.

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED
(To be completed by the Tenderer)

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN
1.	Lighting fittings		
2.	Distribution Board		
3.	Sockets		
4.	Lighting switches		
5.	Telephone and T.V plates		
6.	PVC/SWA/PVC copper cable		
7	CCTV Cameras		
8	Internet Switches		
9	NVR		
10	Batteries		
11	Solar Inverter		
12	Solar Panels		

R621/02E

PROPOSED BLUE SKILLS TRAINING FOR EMPLOYMENT CENTRE (BSTEC) FOR THE KISUMU NATIONAL POLYTECHNIC ON KISUMU MUNICIPALITY / BLOCK 9 / 101

SPECIFICATIONS BILLS OF QUANTITIES VOLUME 3 – LIFT INSTALLATION

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GENERAL AND PARTICULAR SPECIFICATIONS

FOR

LIFT INSTALLATION

GENERAL SPECIFICATIONS FOR LIFTS INSTALLATION WORKS

REGULATIONS

All Apparatus and materials supplied and work carried out shall comply with the provisions of the following documents: -

(a) The latest Edition of I.E.E Regulations

(b) The Kenya Power and Lighting Co. Ltd By-laws

(c) The Electric Power Act and the Rules made there under.

(d) EN81 and C.P 407 (1972)

(e) The requirements of the Chief Inspector of Factories for the Kenya Government, Factories Act Chapter 514 SECTION 30. **The contractor shall avail all the certificates.**

(f) Any other regulations governing lift installations in Kenya

(g) Kenya Bureau of Standards (KBS) lifts standard KS 2169 -1

BUILDER'S WORK BY LIFT CONTRACTOR

A. **Lifts Shaft**

(i) The dimensions of the Lifts shafts are:
a) 1600mm by 1600mm for 1No. Passenger lifts

(ii) The lifts Contractor shall provide cut-outs for hall buttons, hall position indicators, hall lanterns, shaft ventilations and fire man's switch.

It shall be the responsibility of the lifts Contractor to provide, properly position and fix the hall buttons, hall indicators, hall lanterns, fire man's switches, door frames, sills and architraves.

(iii) The lifts Contractor shall provide the necessary scaffolding for erection of equipment and hoarding to secure the work area from general public and maintain safety of the people and other installations in the building.

(iv) The lifts Contractor shall provide temporary electricity supply for erection and shaft lighting, and thereafter a permanent supply from an appropriate isolator.

B. **Lifts Pit**

The lifts contractor shall provide and fix ladders where such facility may be required as stipulated in BS 5655 and terminal and over travel limit switches.

C. Lift Motor Room

The lifts Contractor shall provide the following in the lifts motor room:

(i) Cut-outs for roping, safety gear ropes, selector tapes (where provided) cabling etc. in the lifts motor room floor.

(ii) Lifting beam in the form of a rolled steel joist if required.

(iii) General lighting cable ducts and conduits and power and ventilation equipment.

D. Access

The lifts Contractor shall provide stairway access with lockable doors to the lifts motor room. On the outer side of the door shall be written in red letters:

"DANGERS 415 VOLTS – LIFT MOTOR ROOM – NO UNAUTHORISED PERSON ALLOWED INSIDE"

E. Builder's Work

The lifts Contractor shall provide for:

(i) All chasing, shaft ventilation and making good

(ii) All drilling and plugging of holes in floors, walls, ceiling and roofs for security services, and for equipment requiring screw or bolt fixing.

(iii) Any purpose made fixing brackets

FIREMAN'S SWITCH FOR THE LIFTS

A fireman's control switch shall be provided in the down terminal floor, main entrance lobby. The Fireman's switch shall be of the type approved by the Engineer.

Operation of the Fireman's switch shall stop the lift car on the next landing but without opening the car and landing doors and immediately return the lift to the ground floor irrespective of any other calls and park lift with doors open. The car will then become in-operative with the exception of the 'Fireman's Lift' which shall operate in answer to the car buttons until only the fireman s switch is reset.

EMERGENCY ALARM SYSTEM

An emergency alarm system in the form of an intercom shall be installed between the car, the motor room, and the reception desk on the ground floor.

The alarm system shall be clearly labeled "Emergency Alarm". On pushing an alarm button, the system should ring simultaneously in the car, motor room and the reception desk.

The lifts Contractor shall carry out the wiring in the lift car and between machine and the reception desk. The power supply for the alarm system shall be derived from a self-recharging unit.

EMERGENCY DOOR KEYS

It shall be possible to open every lift-landing door by the use of a release key whether or not the lift car is in the landing zone. The key hole shall be unobtrusive and located at high level.

CALL STATION AND OPERATING PANEL BUTTONS

The call station, distributed between the lifts on each landing, and operating panel buttons shall be micro-motion push button.

7. INTERFERENCE SUPPRESSION

The lift motor and auxiliary controls shall be suppressed so as not to interfere with local radio and television reception and closed-circuit television or Electro mechanical equipment within the building. The suppression shall be carried out in accordance with B.S. 800 and all suppression devices incorporated shall comply with B.S. 5655.

8. PROTECTION PADS

The lifts Contractor shall supply one set of protective quilted cover pads to approval for passenger lift cars.

9. CAR EMERGENCY LIGHTING

The lift cars shall be provided with an emergency light fitting operating from a self-recharging battery unit. The emergency light will be built in the car-operating panel.

10. TEST

Both on completion of his work on the lifts and at the end of the guarantee period, the lifts Contractor shall carry out all the tests as required and in accordance with B.S 5655 part 7 in the presence of the Engineer and shall provide all the necessary instruments, labour and materials to do so at his cost.

Damage occurring, as a result of these tests will be made good by the Lifts Contractor to the Engineer's satisfaction at his expense.

4No. (Four) copies of the test certificates for each lift should be forwarded to the Engineer within 4 days of completion of the last test.

11. TRAINING

The tenderer shall provide in his tender for the training of 2No.technicians on site in the maintenance of the lifts during the dismantling, installation, testing and commissioning period.

12.0 PROTECTION AGAINST POWER/VOLTAGE FLUCTUATIONS, SURGES AND TRANSIENT CURRENTS

12.1 The lift equipment and all its controls shall be protected against power/ voltage fluctuations, surges and transient currents. The contractor shall provide for and install all the necessary equipment for this protection. The protective switchgear shall be verified by the Engineer during the overseas factory inspection.

13.0 INITIAL STATUTORY INSPECTION

13.1 The tenderer shall allow in his tender for the initial statutory inspection of the lifts by an Approved Government Lift Inspector during the commissioning of the new lift, and thereafter for inspection at intervals of six (6) months periodic time during the 12 months defects liability period. One of the inspections shall be done after the expiry of the defects liability period on confirming that all the defects (if any) have been corrected by the lift contractor.

13.2 The employer and the contractor shall, at each inspection, each retain a copy of the lift inspection certificates while the original will be submitted to the Ministry of Labour and Human Resources Development.

14.0 INITIAL MAINTENANCE

14.1 The tenderer shall allow in his tender for the initial routine service maintenance of the new lifts once a month during the 12 months defects liability period and shall carry out all necessary adjustments and repairs, cleaning, greasing and oiling of moving parts.

14.2 During the initial maintenance of the new lifts, the tenderer shall also allow in his tender 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 or parts which are periodically renewed such as brake linings etc., or parts which are faulty for any reason whatsoever excepting always acts of God such as storm, tempest, flood, earthquake and civil revolt, acts of war and vandalism.

14.3 The contractor shall also provide a 24 -hour break-down service to attend to faults on or malfunctioning of the installation between the routine visits of the defect's liability period.

14.4 A monthly report of any works done upon the installation shall be supplied to the Engineer.

15.0 REGISTRATION OF THE NEW LIFTS

15.1 The tenderer shall allow in his tender for the registration of the new lifts with the Ministry of Labour including payments of any fees that may be required. It is the responsibility of the Contractor to avail the registration certificate to the client once the registration has been done.

16.0 INTERIOR LIFT CAR FINISHES

16.1 The interior lift car finishes including ceiling, floor, cabin panels, car door, landing door and architraves shall be to the Engineers approval in liaison with the Client. The approval will be within the range of the manufacturers' range of finishes in their brochures. The tenderer must therefore allow for this in their bid.

PARTICULAR SPECIFICATIONS

1.0 LOCATION OF SITE

The site of the proposed works is on **Kisumu National Polytechnic, Nairobi.**

2.0 DESCRIPTION OF THE WORKS

The project comprises Supply, installation, testing and commissioning to the specifications supplied herein of the following: -

- 1No. 450kg (6 Passenger) lifts – modern microprocessor-controlled lifts – 2 Stops

3.0 CLIMATE CONDITIONS

The following climatic conditions apply at the site of the contract work and the equipment; materials and the installations shall be suitable for these conditions.

Altitude	*1149M*
Mean Maximum Temperature	36.9°C
Mean Minimum Temperature	9°C
Range of Relative Humidity	36%-96%
Longitude (approximately)	36° 45'E
Latitude (approximately)	01°18'S
Salt in the atmosphere	0.02%

Extremely heavy rainfall at certain periods of the year and the contractor shall be deemed to have taken account of this factor both in his prices and his planning of the execution of the contract works.

4.0 GENERAL REQUIREMENTS

The lift Contractor shall supply, deliver unload, hoist, fix and erect, test and commission all the equipment, plant and materials in accordance with all specifications contained in this document including the Building plans to provide a complete and operable installation.

The lifts Contractor shall become liable for defects and be responsible for the initial maintenance of the lifts installed all as specified here in.

5.0 PARTICULAR REQUIREMENTS

The tenderer shall provide factory compliance certificate for EN 81 – 1/1998 to prove compliance with this European code. Failure to provide this shall render the tender non –responsive and hence the bid will not be considered.

6.0 TECHNICAL SPECIFICATION FOR THE LIFTS

a) 6 NO. NEW PASSENGER LIFT

No. of Unit	:	One (1 No.)
Load	:	450Kg (6 persons)
Speed	:	0.6 m/s
Drive	:	Closed loop digital VVVF
Control system	:	Electronic. Fully software based microprocessor controlled system.
Machinery	:	Gearless. Any other machinery to be located either in shaft or in the machine room.

No.of stops : 2
Travelling cable : Travelling cable to serve interface for fire alarm system, C.C.T.V and Audio System to be installed.
Lift Pit : 1500mm
Head room : To be agreed upon after site handing over
Shaft Dimensions : 1600mm x 1600mm
Normal Operation : Simplex function
V.I.P Operation : The car should be programmed to operate for VIP service by key switches located on all the floors.
The car should however clear all the car calls in the direction of travel of the lift made prior to the VIP call.
Power requirements : 415V ac, 3 phase, at 50Hz

6.0) TECHNICAL SPECIFICATION FOR THE LIFTS

b) 1 NO. NEW PASSENGER LIFT

No. of Unit : One (1 No.)
Load : 450Kg (6 persons)
Speed : 1.0 m/s

Drive : Closed loop digital VVVF

Control system : Electronic. Fully software based microprocessor controlled system.

Machinery : Gearless. Any other machinery to be located either in shaft or in the machine room.

No.of stops : 2

Travelling cable : Travelling cable to serve interface for fire alarm system, C.C.T.V and Audio System to be installed.

Lift Pit : 1500mm
Head room : To be agreed upon after site handing over
Shaft Dimensions : 1600mm x 1600mm
Normal Operation : Triplex function
V.I.P Operation : The car should be programmed to operate for VIP service by key switches located on all the floors.
The car should however clear all the car calls in the direction of travel of the lift made prior to the VIP call.
Power requirements : 415V ac, 3 phase, at 50Hz

Other main facilities and functions to be included for all the lifts : Car door operation shall be fully automatic with (infra-red) electronic door sensors

: Car position indicator

: Door button – re-open

: Voice guidance system (voice synthesizer)

: Emergency power operation and system backing

: Intercom facility – 3 way

: Alarm power unit and bell complete with a maintained back-up power supply

: Safe landing with deviation of not more than 3mm

: Floor position indicator on every floor

: Independent service key operation

: Cabin ventilation shall be tropicalised high Capacity cylinder type operation.

: Car extract fan should be powerful, quiet, drought free and multi-directional complete with a maintained back-up power supply

: Shall incorporate an Audio Visual car overload divice.

: Shall have forced ventilation key switch.

Code compliance : The lifts shall comply with BS 5655 or European Specifiadction equivalent code EN 81 and KS 2169 -1

Structural Openings : The lift Contractor shall set the landing doors at 10mm from the finished floor levels so as to get a fall away from the landing to prevent water from flowing down the lift shafts when washing up.

Entrances : The lifts car shall have automatic high speed power operated 2 panel centre openings of 1000mm wide by 2100mm high and as on site for the existing lift.

Landing door : Stainless steel to Engineer's approval.

Car door : Stainless steel to Engineer's approval.

Landing door architraves: Architraves to be granito tiles of a client approved colour with an aluminium strip at the edge, all to the Engineer's approval.

Wall switches : All operating switches in the lifts shaft shall be of the totally enclosed drip proof type.

Lighting : Indirect Lighting shall be fitted in the car to a level of 150 lux.

Cabin walls : Stainless steel to Engineer's approval

Car interior fronts : Stainless steel to Engineer's approval.

Mirror : Three quarter full height at the rear car panel.

Door Operation : Heavy duty variable frequency driven door operators on a frame above the lift car.

: Fully adjustable door open and close speeds - micro-processor controlled. The goods lift has no mirror and/or hand rail.

: Intelligent speed adjustments to cope with traffic requirements
: Full curtain electronic infrared 3 dimensional detectors.
: An electro- mechanical type tested interlock shall be provided, fitted on the landing door and operated by the door lock cam on the lift car to prevent movement of the lift car until the landing door is both mechanically and electronically locked.

Hand rails : Round sectioned stailess steel on the 3 panels of the lift car.

Emergency light: Emergency light in the lift cars shall be 6 watts complete with a maintained back-up power supply

Signal Hall Lanterns : LCD displays and different tones for up and down motions.

Signal fixtures : Wide angle view car position indicator unit with high relieable ELD technology.

Floor buttons : Micromotion with ring illumination
: Brushed stainless steel plate with Braille indication.

Floor : Rubber knobbed tiles, not less than 6mm thick.

Car position indicators : Car position indicators shall be digital LCD type.

Car direction indicators : Car direction indicators shall have polycargonate covers and 160° angle view.

Manual operation : Provision shall be made for manual raising and lowering by means of spokeless wheel. This wheel shall be mounted on the drive motor. This facility should be availed at the control panel for machine room less lift.

Painting : All parts of the control equipment, switchgear trunking bed plates and closed sections of metal parts which will not be accessible for painting after erection shall be given three coats of paint at the manufacture's works.

All bright surfaces shall be coated with lacquer or other protective coating before leaving the manufacturer's works. Metal works in the lift shaft shall be painted on site with three coats of best quality oil paint. The lifts machine and other machinery located in the lifts motor room shall be painted with three coats of best quality oil paint one coat being applied after erection.

Guarantee of Spare parts: The tenderer must confrim in writing and provide written commitment from manufacturer, the availability of parts for the make of lift proposed for installation, for a continous period of at least 10 (ten) years.

Construction : In general, the lift car shall be constructed from pressed steel.The method of construction and strenth of lift cars ,doors and panels shall complywith B.S. 5655. Part 1 1970 and the amendments and in accordance with European code EN 81.

Base frame :The complete hoisting equipment shall be mounted on base frame of fablicated steel which when installed shall be insulataed from the building structure by means of rubber or other approved sound and viration isolated material provided and fixed in an approved manner between frame and the supporting beams.

Power factor : The powerfactor for the drive shall not be less than 0.9 lagging.

Access Control: Provision for access control via proximity cards with an interface that can be integrated with the facility's access control system.

In Addition to the above requirements, the following facilities **should** be provided for **any** Machine Room less Unit.

: **Drive Unit-**This shall be a gearless unit, to be mounted within the lift shaft so that it can be maintained from the lift pit floor.

: **Controller-** This shall be on the top floor landing of the lifts where the equipment can be worked on safely. The lift electrical services and mains supply shall be provided next to the controller.

7.0 INFROMATION TO BE SUPPLIED BY THE TENDERER

7.1 The tenderer shall fill in the following information pertaining to the lifts being offered during tendering: -

(i) Type of Drive Motor ……

(ii) Size of the Drive Motor (KW)……

(iii) Country of Manufacture ……

(iv) Power Factor ……

(v) Starting Current A ……

(vi) Running Current B. ……

(vii) Duration of Starting Current ……

(viii) Lift Capacity (Kg/Persons)……

(ix) Lift Speed ……

(x) Landing Doors Type ……

(xi) Landing Doors Safety Features……

(xii) Dimensions of Lift Car ……

(xiii) Shaft dimensions ……

Statement of Compliance

a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.

b) I confirm I have not made and will not make any payment to any person, who can be perceived as an inducement to win this tender.

Signed: ……*for and on behalf of the Tenderer*

Date: ……..

Official Rubber Stamp: ……

SECTION B

BILLS OF QUANTITIES

A) PRICING OF PRELIMINARIES ITEMS

Prices will be inserted against item of preliminaries in the sub-contractor's Bills of Quantities and specification. These Bills are designated as Bill No.1 in this Section. Where the Contractor fails to insert his price in any item he shall be deemed to have made adequate provision for this on various items in the Bills of Quantities. The preliminaries form part of this contract and together with other Bills of Quantities covers for the costs involved in complying with all the requirements for the proper execution of the whole of the works in the contract.

The Bills of Quantities are divided generally into three sections:

Installation Items – Other Bills

The brief description of the items in these Bills of Quantities should in no way modify or supersede the detailed descriptions in the contract Drawings, conditions of contract and specifications.
The unit of measurements and observations are as per those described in clause 1.0 5 of the section C.

Summary

The summary contains tabulation of the separate parts of the Bills of Quantities carried forward with provisional sum, contingencies and any prime cost sums included. The Contract shall insert his totals and enter his grand total tender sum in the space provided below the summary.

This grand total tender sum shall be entered in the Form of Tender provided elsewhere in this document.

SPECIAL NOTES TO BILLS OF QUANTITIES

1. The Bills of Quantities form part of the contract documents and are to be read in conjunction with the contract drawings and general specifications of materials and works.

2 All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part thereof.

3. The brief description of the items given in the Bills of Quantities are for the purpose of establishing a standard to which the Contractor shall adhere. Otherwise, alternative brands of **equal** and **approved** quality will be accepted.

Should the Contractor install any material not specified here in before receiving **written approva**l from the Project Manager, the Contractor shall remove the material in question and, **at his own cost**, install the proper material.

4. The grand total of prices in the price summary page must be carried forward to the **Form of Tender for the tender to be deemed valid**.

5. Tenderers must enclose, together with their submitted tenders, manufacturer's brochures detailing technical literature and specifications of the generator set that they intend to offer. Where the brochure contains different sizes of lifts, the bidders MUST clearly mark out the size of lift they intend to offer by using a 'mark pen'.

The brochures are to be used to ascertain the suitability of the lift being offered by the bidders, and bidders not complying with this requirement may be considered non-responsive and may be disqualified from technical evaluation.

PRICE SCHEDULE 2.0 – PRICE FOR 1NO. PASSENGER LIFTS (2 STOPS)

Item	Description	Unit	Qty	Kshs.	Cts
2.1	Price for all imported materials (Note : Bidder to give break-downs on a separate sheet)	Item	1		
2.2	Price for locally purchased materials, installation, testing and commissioning costs (give breakdown on separate sheet).	Item	1		
2.3	Electrical works provisions shaft lights, Fire alarm provisions, power supply cabling & Access Control Provisions	Item	1		
2.4	Suitable rated AVS Equipment, Cabling & Accessories	Set	1		
2.5	Lift Monitoring Unit with Digital display, PC Computer, cabling & accessories to management office	Item	1		
2.6	Associated builders work: Entry lobby finishes, shaft finishes, concrete surrounds, plaster & painting finishes to Architects Approval	Item	1		
2.7	Price for full-service maintenance of the 1 No. New lift during the 12 months defects liability period for whole period as described on page F/4 clause 14.0	Item	1		
2.8	Price for Statutory inspection of the 1No. Lift as described on page F/4 clause 13.0	Item	1		
2.9	Price for Registration of the 1No. Lift as described on page F/4 clause 15.0	Item	1		
2.10	Price for 4 Sets of operation and maintenance manuals as described in the specifications	Set	1		
2.11	Price for 2 sets of record drawing as described in the specifications	Set	1		
2.12	Price for the Travelling cable for interfacing fire alarm system, C.C.T.V and Audio system to be installed by others.Include high quality speakers connected to the cable and installed in the lift car to engineers approval.	Item	1		
2.13	Allow for connection of a telephone extension from the premises EPABX with the telephone instrument in the lift car all wiring and accessories included	Item	1		
2.14	Allow for Shop drawings	Item	1		
SUB-TOTAL FOR 1NO. PASSENGER LIFTS, 2 STOPS CARRIED FORWARD TO PRICE SUMMARY – KISUMU NATIONAL POLYTECHNIC					

Item	Description	Unit	Qty	Kshs.	Cts
	Sub Total Brought Forward from Previous Page G/8				
3.15	Asubmersible Pump capable of delivering $2m^3$/hr against 5M head, power rating 1KW, single phase, 50Hz as pedrollo $Upm^2/2$ or equal and approved complete with control panel, associated electrical works protection against dry run, on/off neon lights, control / pump status display panel, audio alarm with manual silencer to indicate when the pump is faulty, float switch and all necessary controls.	No.	1		
3.16	50mm diameter heavy duty PVC pipe sleeves to the external drains	Item	1		
SUB-TOTAL FOR 1NO. PASSENGER LIFTS, 2 STOPS CARRIED FORWARD TO PRICE SUMMARY – KISUMU NATIONAL POLYTECHNIC					

PRICE SUMMARY

Item	Description		Kshs	Cts
1.0	Sub – total 1 No. Passemnger Lift (2 Stops) Balance carried forward from page B/4	Sum		
2.0	Allow **Kshs. 200,000.00** Contingency to be expended at the Engineers/ Clients discretion.	Sum	200,000	00
GRAND TOTAL OF PRICES CARRIED FORWARD TO FORM OF MAIN SUMMARY- KISUMU NATIONAL POLYTECHNIC		**Sum**		

Foreign currency, if any, on which the Tender is based ……

Exchange rate applied ……

Total amount in words: Kenya Shillings ……

……

Signed by Tenderer ……

P.I.N. ……VAT Reg. No ……

Date: ……

Official Rubber Stamp ……

Signed by Witness ……

Name of Witness ……

Address ……

Date ……

APPENDIX TO BILLS OF QUANTITIES

APPENDIX 'A'

PRICE BREAKDOWN OF IMPORTED MATERIALS

(Note: Bidder MUST prepare seperate breakdowns for the passenger Lifts)

Item	Description	Unit	Qty	Cost (Kshs.)

Signed By Tenderer ……..

Official Stamp ……..

……

Date ……

APPENDIX TO BILLS OF QUANTITIES

APPENDIX 'B'

PRICE BREAKDOWN OF LOCALLY PURCHASED MATERIALS

(Note: Bidder MUST prepare seperate breakdowns for the passenger lifts)

Item	Description	Unit	Qty	Cost (Kshs.)

Signed By Tenderer ……..

Official Stamp ……..

……

Date ……

SECTION C

FULL SERVICE MAINTANANCE

DURING 36 MONTHS AFTER DEFECTS LIABILITY PERIOD

FULL SERVICE MAINTANANCE DURING 36 MONTHS AFTER DEFECTS LIABILITY PERIOD

SPECIAL NOTES

1. The tenderer is advised to note that their price shall be used in the evaluation of the tenders.

2. The tenderer shall price for both labour and consumables(materials) during the 36 months full service period in appenix A of this section. The price shall be for supply, installation, testing and commissioning including all taxes applicable at the time of tender.

3. The tenderer shall list and price the consumable/ spare parts/ materials to be used during the 36 months full service period in appenix B of this section. The price shall be for supply, installation, testing and commissioning including all taxes applicable at the time of tender.

4. The tenderer shall list and price the consumable/ spare parts/ materials to be used during the 36 months full service period. This list is to be comprehensive as possible and shall inculde major spares as cards, fan motors etc. The price shall be for supply, installation, testing and commissioning including all taxes applicable at the time of tender. These are the spare parts that are not required during the normal routine maintenance. These spare parts shall only be paid for as and when repalced. The tenderer shall give the details of these spare parts in in appenix C of this section.

5. The price quoted for the above lifts shall be as per the Standard Maintanance Tender Document which can be examined at the offices of the Project Manager.

6. The tenderer shall be required to the sign the 36 Months after Defects Liability Maintanance Contract based on the price quoted and the Standard Maintanance Tender Document refered to in item 5 above.

7. The tenderer **MUST** fill all the prices and rates in the Appendices A, B and C of this section. Failure to do so shall lead to disqualification.

APPENDIX 'A'

PRICE FOR FULL NORMAL ROUTINE MAINTANANCE DURING 36 MONTHS AFTER DEFECTS LIABILITY PERIOD FOR THE 1NO. LIFT

Item	Description	Kshs	Cts
1.0	Labour costs per month		
2.0	Material costs for spare parts (consumables) per month – see Appendix C of this section		
Sub-total for one (1No.) Monthly Maintenance after the Defects Liability Period (Not to be carried to Form of Tender)			
Grand Total for 36 Months Maintenance after the Defects Liability Period (Not to be carried to Form of Tender)			

Signed by the Tenderer.....

Official Stamp .....

Date.....

APPENDIX 'B'

SCHEDULE OF UNIT RATES OF SPARE PARTS THAT MAY BE REQUIRED DURING 36 MONTHS AFTER DEFECTS LIABILITY MAINTENANCE PERIOD (ATTACHMENTS ARE ALLOWED IF THE LIST IS LONG)

Item	Description	Unit	Qty	Cost(Kshs.)
Total (Not to be carried to Form of Tender)				

Signed By Tenderer ……

Official Stamp ……

……

Date ……

APPENDIX 'C'

PRICE BREAKDOWN OF SPARES / CONSUMABLES TO BE USED DURING 36 MONTHS AFTER DEFECTS LIABILITY MAINTENANCE PERIOD FOR THE 1NO. LIFT

NOTE: The Price Total in this Appendix C SHOULD tally with the Grand Price Total in Appenix A of this section.

Item	Description	Unit	Qty	Cost(Kshs.)
Total (Not to be carried to Form of Tender)				

Signed By Tenderer ……

Official Stamp ……

……

Date ……

SECTION D

TECHNICAL SCHEDULE

OF

ITEMS TO BE SUPPLIED

TECHNICAL SCHEDULE

1.0 The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders

2.0 The filling of this schedule forms part of Technical Evaluation of the tenders, and bidders shall therefore be required to indicate the type/make and country of origin of all the materials and equipments they intend to offer to the employer as they shall listed in the technical schedule.

3.0 Any bid returned with unfilled Technical Schedule shall be considered technically non-responsive, and the bidder may be disqualified.

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

(To be completed by the Tenderer)

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN

PRIME COST AND PROVISIONAL SUMS

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PRIME COSTS AND PROVISIONAL SUMS				
	BUILDER'S WORK IN CONNECTION WITH SERVICES (PROVISIONAL)				
	ELECTRICAL				
	Cutting and forming chases, mortices, holes in walls and concrete structure for electrical conduits and making good disturbed surfaces for the following				
A	Distribution Boards	No	180		
B	Light Points	No	1,620		
C	Switches	No	1,350		
D	Single Socket	No	90		
E	Double Socket	No	630		
F	TV Point	No	90		
G	Dp Switch	No	90		
H	Cooker control unit	No	90		
J	Single non switched	No	180		
	BUILDERS WORKS IN CONNECTION WITH SERVICES (MECHANICAL) CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	BUILDER'S WORK IN CONNECTION WITH SERVICES (PROVISIONAL)				
	MECHANICAL				
	Cutting and forming chases, mortices, holes in walls and concrete structure for mechanical pipes and making good disturbed surfaces.				
A	Wc inlet point	No	270		
B	WHB inlet Point	No	270		
C	Kitchen Sink inlet point	No	90		
D	Shower inlet point	No	270		
E	Washing Machine inlet point	No	90		
F	Dhobi Sink inlet point	No	90		
G	Wc Drainage point	No	270		
H	WHB Drainage Point	No	270		
J	Kitchen Sink Drainage point	No	90		
K	Shower drainage Point/Floor trap	No	270		
L	Washing Machine drainage	No	90		
M	Dhobi Sink Drainage point	No	90		
	BUILDERS WORKS IN CONNECTION WITH SERVICES (MECHANICAL) CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROVISIONAL SUMS **The following Provisional Sums are to be measured on completion and priced in accordance with the rates contained in these bills of Quantities or pro-rata thereto or deducted in the whole if not required**				
A	Signage		sum		430,000.00
B	Storm water drainage		sum		1,500,000.00
	PRIME COST SUMS CARRIED TO GRAND SUMMARY				

Item	Description	Unit	Qty	Rate	Amount (Kshs)
	PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC				
	PROVISIONAL SUMS				
	ELEMENT No.		**PAGE No.**		
	1. BWIC ELECTRICAL WORKS		PS/ 1		
	2. BWIC MECHANICAL WORKS		PS / 2		
	3. PROVISIONAL SUMS		PS / 3		
	TOTAL PROVISIONAL SUMS CARRIED TO MAIN SUMMARY				

DAY WORKS

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	DAYWORKS				
	(All Provisional)				
	Labour				
	Rates for labour shall include for all payments made in accordance with statutory requirements, overtime payments, bonus and incentive payments, travelling allowances and expenses to workmen actually employed on the completion of the Works, supervisory,administrative, clerical, welfare and safety costs, use and waste of protective clothing, tools, overheads and profit, establishment and other charges not covered in the Preliminaries				
A	Skilled labourers	Hrs	1		
B	Unskilled labourers	Hrs	1		
	Plant				
	The rates for plant shall include for all repairs, maintenance, standing or non-operating time, drivers, operators, helpers, fuel, oil, grease and perts, insurances, licences, costs of bringing to site and removing from site and overheads, profits, establishment and other charges not included in preliminaries. Payments shall be based on 'the nett actual hours or parts of an hour employed				
C	Lorry (8 tonne capacity)	Hrs	1		
D	Tipper (8 tone capacity)	Hrs	1		
E	Pneumatic compressors 160 CFM with three jacks complete with drillers, breakers, chisels, plugs, feathers and the like	Hrs	1		
F	Water pump complete with engine; 10CM/Hr output	Hrs	1		
G	Power hand tools (power drill, grinders, jack hammer etc)	Hrs	1		
H	Poker vibrators complete	Hrs	1		
J	Mobile crane, 10 tons	Hrs	0		
K	14 Cu. Ft Concrete mixer	Hrs	1		
L	9 Cu. Ft Concrete mixer	Hrs	1		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	Plant cont'd				
A	JCB - Backhoe excavator; 2Ton	Hrs	1		
B	Bulldozer	Hrs	1		
C	Motor grader 140G CAT	Hrs	1		
D	Compactor roller; single drum CAD25D	Hrs	1		
E	Power generator; 11.5KVA	Hrs	1		
F	Water bowser 10,000Ltrs.	Hrs	1		
G	Steel Prop (1 No.)	Day	1		
H	Steel Scaffolding (per set)	Day	1		
	Materials				
	The rates of materials used in Daywork shall be the nett cost to the Contractor after the deduction of all discounts and shall include for all haulage, storage, handling insurances, use of plant and hoisting, overheads and profit, establishment and other charges not included in preliminaries. All materials shall be as described herein				
J	Ordinary Portland Cement (50kg bag)	Bag	1		
K	Clean river sand	tonne	1		
L	12-20mm graded coarse aggregate	tonne	1		
M	Graded crushed stone (crusher run - 0 to 6mm)	tonne	1		
N	Ready mix concrete class 20	cm	1		
P	Ready mix concrete class 25	cm	1		
Q	Ready mix concrete class 35	cm	1		
R	Murram	tonne	1		
S	Hardcore	tonne	1		
T	Red soil	tonne	1		
U	Steel reinforcement bars	Kg	1		
V	Sawn cypress timber 100 x 50mm	m	1		
W	Clear glass; 6mm thick	sm	1		
	Carried to Collection				

Item	Description	Unit	Qty	Rate	Amount (Ksh)
	Distibution of materials and labour in Contractor's rates for purposes of rate fluctuation computation Materials ……..% Labour ...……..%				
	Carried to Collection				
	COLLECTION From Page DW/1 From Page DW/2 From Page DW/3 (above)				
	DAYWORKS CARRIED TO GRAND SUMMARY				

GRAND SUMMARY

PROPOSED BLUE SKILLS TRAINING AND EMPLOYMENT CENTRE (BSTEC) ON PLOT LR NO. KISUMU MUNICIPALITY / BLOCK 9 / 101 FOR THE KISUMU NATIONAL POLYTECHNIC

GRAND SUMMARY

General Summary	PAGE	Amount
Bill No. 1: General Preliminaries		
Bill No. 2: Particular Preliminaries		
Bill No. 3: Environmental, Social, Health & Safety activities		
Bill No. 4: Builders Works		
Bill No. 5: External Works		
Bill No. 6: Plumbing , Drainage, Air Conditioning & Firefighting		
Bill No. 7: Electrical Installation works & ICT installation Works		
Bill No. 8: Lift Installation		
Bill No. 9: Provisional Sums		
Subtotal of Bills		
Total for Daywork (Provisional Sum) *		
Specified Provisional Sums not included in subtotal of bills[ii]		
Total of Bills Plus Provisional Sums (A + B + C) [i]		
Bid Price (F) (Carried forward to Letter of Bid)		
16% VAT (G) (Carried forward to Letter of Bid)		