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# **BILLS OF QUANTITIES**

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**PARTICULAR PRELIMINARIES**

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
	<p><b><u>PARTICULAR PRELIMINARIES</u></b></p> <p><b>A PRICING ITEMS OF PRELIMINARIES</b></p> <p>Prices <b>SHALL BE INSERTED</b> against items of “preliminaries” in the tenderer’s priced Bills of Quantities. The contractor is advised to read and understand all preliminary items.</p> <p><b>B DESCRIPTION OF THE WORKS</b></p> <p>The works to be carried out under this contract is renovation works to coffee Plaza that constitute ; Demolition Works, Floor Finishes, Ceiling Finishes,Wall Finishes,Windows,Doors ,Electrical and Mechanical Works.</p> <p><b>C MEASUREMENTS</b></p> <p>In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT MANAGER in accordance with Clause 12 of the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with Clause 12 of the said Conditions.</p> <p><b>D LOCATION OF SITE</b></p> <p>The site of the proposed works is at At The Coffee Plaza-CBD ,Nairobi County. The Contractor is advised to visit the site, to familiarize with the nature and position of the site. No claims arising from the Contractor’s failure to do so will be entertained.</p> <p><b>E SIGNING OF THE TENDER DOCUMENTS</b></p> <p>The bidder shall append his / her signature and / or company ‘s rubberstamp on each and every page of tender document.</p>	
	Carried to collection	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
<b>A</b>	<p><b>DEMOLITIONS AND ALTERATIONS</b></p> <p>The Contractor is to allow for all temporary protection required during the works including ordinary and special dust screens, hoardings, barriers, warning signs, etc as directed by the Project Manager and</p> <p>as necessary for the adequate propping and protection of existing property, finishes, workmen employed on the site, employer's agents and the public. Any damage or loss incurred due to the insufficiency of such protection must be made good by the Contractor. All protective devices are to be removed on completion of the works and any necessary making good consequent upon this is to be executed to the satisfaction of the Project Manager</p> <p>The works shall be propped, strutted and supported as necessary before any alteration or demolition work commences. Prices shall include for all cleaning and preparatory work to structure and finishes and for making good to all finishes on completion whether or not specifically described.</p> <p>The Contractor shall be entirely responsible for any breakage or damage which may occur to materials required for re-use during their removal unless it is certified by the Project Manager that such damage or breakage was inevitable as a result of the condition of the item concerned</p>	
<b>B</b>	<p><b>CLEARING AWAY</b></p> <p>The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate and upon completion of the works, remove and clear away all plant, equipment, rubbish, unused materials and stains and leave in a clean and tidy state to the reasonable satisfaction of the Project Manager.</p> <p>The whole of the works shall be delivered up clean, complete and in perfect condition in every respect to the satisfaction of the Project Manager.</p>	
<b>C</b>	<p><b>CLAIMS</b></p> <p>It shall be a condition of this contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and / or expenses due to any of the contract conditions, or by any other reason whatsoever, he shall present such a claim or intent to claim notice to the PROJECT MANAGER within the contract period. No claim shall be entertained upon the expiry of the said contact period.</p>	
	<b>Carried to collection</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
<b>A</b>	<p><b>PAYMENTS</b></p> <p>The tenderer's attention is drawn to the fact that the GOVERNMENT DOES NOT MAKE ADVANCE PAYMENTS but pays for work done and materials delivered to sit: all in accordance with Clause 14 of the General Conditions of Contract Agreement. In order to facilitate this, a list of the general component elements for the works is given at the summary page of these specifications and the tenderer is requested to break down his tender sum commensurate to the said elements</p>	
<b>B</b>	<p><b>PREVENTION OF ACCIDENT, DAMAGE OR LOSS</b></p> <p>The Contractor is notified that these works are to be carried out on a restricted site where the client is going on with other normal activities. The Contractor is thus instructed to take reasonable care in the execution of the works as to prevent accidents, damage or loss and disruption of activities being carried out by the Client. The Contractor shall allow in his rates any expense he deemed necessary by taking such care within the site.</p>	
<b>C</b>	<p><b>WORKING CONDITIONS</b></p> <p>The Contractor shall allow in his rates for any interference that he may encounter in the course of the works for the Client may in some cases ask the Contractor not to proceed with the works until some activities within the site are completed, as the facility will be operating as usual during the course of the contract.</p>	
<b>D</b>	<p><b>SIGNBOARD</b></p> <p>Allow for providing, erecting, maintaining throughout the course of the Contract and afterwards clearing away a signboard as designed, specified and approved by the Project Manager.</p>	
<b>E</b>	<p><b>LABOUR CAMPS</b></p> <p>The Contractor shall not be allowed to house labour on site. Allow for transporting workers to and from the site during the tenure of the contract.</p>	
<b>F</b>	<p><b>MATERIALS FROM DEMOLITIONS</b></p> <p>Any materials arising from demolitions and not re-used shall become the property of the client</p>	
	<b>Carried to collection</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
<b>A</b>	<p><b>PRICING RATES</b></p> <p>The tenderer shall include for all costs in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract.</p>	
<b>B</b>	<p><b>SECURITY</b></p> <p>The Contractor shall allow for providing adequate security for the works and the workers in the course of execution of this contract. No claim will be entertained from the Contractor for not maintaining adequate security for both the works and workers.</p>	
<b>C</b>	<p><b>URGENCY OF THE WORKS</b></p> <p>The Contractor is notified that these “ works are urgent” and should be completed within the period stated in these Particular Preliminaries.</p> <p>The Contractor shall allow in his rates for any costs he/ she deems that he/she may incur by having to complete these works within the stipulated contract period.</p>	
<b>D</b>	<p><b>PAYMENT FOR MATERIALS ON SITE</b></p> <p>All materials for incorporation in the works must be stored on site before payment is effected, unless specifically exempted by the Project Manager. This is to include materials of the Contractor, nominated sub-Contractors and nominated suppliers.</p>	
<b>E</b>	<p><b>EXISTING SERVICES</b></p> <p>Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the area and he/she shall make whatever provisions may be required by the authorities concerned for the support, maintenance and protection of such services.</p>	
<b>F</b>	<p><b>CONTRACT COMPLETION PERIOD</b></p> <p>The contract completion period in accordance with condition clause 10 of the Conditions of contract must be adhered to.</p> <p>The ‘PROJECT MANAGER’ shall strictly monitor the Contractors progress in relation to the progress chart and should it be found necessary the ‘PROJECT MANAGER’ shall inform the Contractor in writing that his actual performance on site is not satisfactory .In all such cases the Contractor shall accelerate his rate of performance production and progress by all means such as additional labour,plant, e.t.c and working overtime all at his cost.</p>	
	<p><b>Carried to collection</b></p>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
<b>A</b>	<p><b>PERFORMANCE BOND</b></p> <p>A bond of 5% of the contract sum will be required in accordance with clause 48 (as amended) of the Instructions to Tenderer's. No payment on account for the works executed will be made to the contractor until he has submitted the Performance Bond to the Project Manager duly signed, sealed and stamped from an approved Bank.</p>	
<b>B</b>	<p><b>TENDER DOCUMENTS</b></p> <p>Tender documents are as listed in Sub-Clause 6 of the Instruction to Tenderer.</p>	
<b>C</b>	<p><b>DELIVERY OF TENDER</b></p> <p>Tenders and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents or as indicated in the advertisement.</p> <p>Tenders will be opened at the time specified in the letter accompanying these Tender Documents or as indicated in the advertisement. Tenders delivered/received later than the above time will not be opened.</p>	
<b>D</b>	<p><b>VALUE ADDED TAX</b></p> <p>The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1<sup>st</sup> September, 1993 which requires payment of VAT on all contracts. The Contractor should therefore include allowance in his rates and prices for prices for VAT and any other Government taxes currently in force.</p> <p>The tenderer is advised that in accordance with Government public notice No. 35 &amp; 36 Dated 11<sup>th</sup> September 2003 operational from 1<sup>st</sup> October 2003, VAT will be deducted against the contract sum at the prevailing rate by the Employer and remitted directly to the Commissioner of VAT through all interim certificates. It should however be noted that this is not additional tax but a new mode of payment for VAT, any excess payment will be refundable once the Contractor has submitted monthly returns to the Commissioner of VAT who will do the refunds when satisfied that the VAT regulations have been complied with.</p> <p><b>ALL RATES SHALL BE VAT INCLUSIVE</b></p>	
	<b>Carried to collection</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
	<b>PROJECT MANAGEMENT EXPENSES</b>	
<b>A</b>	Allow a provisional sum of Kenya Shillings One Million (Kshs 1,000,000.00) only for the Project Management expenses.	1,000,000.00
<b>B</b>	Allow a percentage for Contractor's overhead costs and profits (-----%)	
	<b>TRANSPORT</b>	
<b>C</b>	<p>The contractor shall provide transport from State Department for Public Works Headquarters to Coffee Directorate Plaza and back (Approximately 4 KM) whenever instructed by the PM for the duration of the contract. The transport shall be in form of Nine Seater Nissan Van or equivalent. The vehicle together with a licensed and competent driver, shall be available to the PM for the duration of the trip until released:</p>	
	The contractor shall ensure that the vehicle is properly licensed , comprehensively insured and in good state of maintenance.	
	The Project Manager may reject an unsatisfactory vehicle or driver and order acceptable replacement	
	<b>Reimbursement for transport shall be as follows:-</b>	
	By a rate per (1 day ) trip for providing a satisfactory vehicle together with a licensed , competent and acceptable driver and his subsistence allowances,adequate fuel for the trip as per tenderer's quoted rates below.	
	Allow for providing a satisfactory vehicle together with a licensed and competent driver ,adequate fuel for the 1 day trip and driver allowance for a total of 15 trips @ <b>Kshs 2,500.00</b> Per Trip	37,500.00
	Allow a percentage for Contractor's overhead costs and profits (-----%)	
	<b>Carried to collection</b>	



**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS
	<p><b><u>COLLECTION</u></b></p> <p>Brought forward from page PP/1</p> <p>Brought forward from page PP/2</p> <p>Brought forward from page PP/3</p> <p>Brought forward from page PP/4</p> <p>Brought forward from page PP/5</p> <p>Brought forward from page PP/6</p> <p>Brought forward from page PP/7</p>	
	<b>TOTAL FOR PARTICULAR PRELIMINARIES CARRIED TO GRAND SUMMARY</b>	

**GENERAL PRELIMINARIES**

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p>A.</p>	<p><b>GENERAL PRELIMINARIES</b></p> <p><b>PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES</b></p> <p>Prices will be inserted against items of Preliminaries in the Contractor's priced Bills of Quantities and Specification.</p> <p>The Contractor shall be deemed to have included in his prices or rates for the various items in the Bills of Quantities or Specification for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract.</p> <p><b>ABBREVIATIONS</b></p> <p>Throughout these Bills, units of measurement and terms are abbreviated and shall be interpreted as follows:-</p> <p><i>C.M.</i>                      Shall mean cubic metre</p> <p><i>S.M.</i>                      Shall mean square metre</p> <p><i>L.M.</i>                      Shall mean linear metre</p> <p><i>MM</i>                        Shall mean Millimetre</p> <p><i>Kg.</i>                        Shall mean Kilogramme</p> <p><i>No.</i>                        Shall mean Number</p> <p><i>Prs.</i>                        Shall mean Pairs</p> <p><i>B.S</i> Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.1., England.</p> <p><i>Ditto</i> Shall mean the whole of the preceding description except as qualified in the description in which it occurs.</p> <p><i>m.s.</i>                      Shall mean measured separately.</p> <p><i>a.b.d</i>                      Shall mean as before described.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A.</b></p>	<p><b>EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT</b></p> <p><i>Attendance</i> ; Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:-</p> <p>Attendance on nominated Sub-Contractors shall be given as an item in each case shall be deemed to include: allowing use of standing scaffolding, mess rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary;providing space for office accommodation and for storage of plant and materials;providing light and water for their work: clearing away rubbish; unloading checking and hoisting: providing electric power and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub- Contractors' work and being responsible for the accuracy of the same.</p> <p><i>Fix Only:-</i></p> <p>"Fix Only" shall mean take delivery at nearest railway station (Unless otherwise stated), pay all demurrage charges, load and transport to site where necessary, unload, store, unpack, assemble as necessary, distribute to position, hoist and fix only.</p>		
<p><b>B.</b></p>	<p><b>EMPLOYER</b></p> <p>The "Employer" is <b>COFFEE DIRECTORATE</b></p> <p>The term "Employer" and "<b>COFFEE DIRECTORATE</b>" wherever used in the contract document shall be synonymous</p>		
<p><b>C.</b></p>	<p><b>PROJECT MANAGER</b></p> <p>The term "P.M." wherever used in these Bills of Quantities shall be deemed to imply the Project Manager as defined in Condition 1 of the Conditions of Contract or such person or persons as may be duly authorised to represent him on behalf of the Government.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<b>A</b>	<p><b>ARCHITECT</b></p> <p>The term "Architect" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is the State Department For Public Works , P.O. Box 30743-00100, NAIROBI.</p>		
<b>B</b>	<p><b>QUANTITY SURVEYOR</b></p> <p>The term "Quantity Surveyor" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is the State Department For Public Works , P.O. Box 30743-00100, NAIROBI.</p>		
<b>C</b>	<p><b>ELECTRICAL ENGINEER</b></p> <p>The term "Electrical Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is the State Department For Public Works , P.O. Box 30743-00100, NAIROBI.</p>		
<b>D</b>	<p><b>MECHANICAL ENGINEER</b></p> <p>The term "Mechanical Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is the State Department For Public Works , P.O. Box 30743-00100, NAIROBI.</p>		
<b>E</b>	<p><b>STRUCTURAL ENGINEER</b></p> <p>The term "Structural Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is the State Department For Public Works , P.O. Box 30743-00100, NAIROBI.</p>		
	<b>Carried to collection</b>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p align="center"><b>A</b></p>	<p><b>FORM OF CONTRACT</b></p> <p>The Form of Contract shall be as stipulated in the Republic of Kenya's Standard Tender Document for Procurement of Building Works (2022 Edition) included herein The Conditions of Contract are also included herein <b>Conditions of Contract</b> These are numbered from 1 to 20 as set out in pages 93 to 146 of these tender documents.Particulars of insertions to be made in the Appendix to the Contract Agreement will be found in the Particular Preliminaries part of these Bills of Quantities</p>		
<p align="center"><b>B</b></p>	<p><b>PLANT, TOOLS AND VEHICLES</b></p> <p>Allow for providing all scaffolding, plant, tools and vehicles required for the works except in so far as may be stated otherwise herein and except for such items specifically and only required for the use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.</p>		
<p align="center"><b>C</b></p>	<p><b>MATERIALS AND WORKMANSHIP.</b></p> <p>All materials and workmanship used in the execution of the work shall be of the best quality and description unless otherwise stated. The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are on site when required for use in the works when required. The Bills of Quantities shall not be used for the purposed of ordering materials</p> <p>All materials and workmanship used in the execution of the work shall be of the best quality and description unless otherwise stated. The Contractor shall order all materialsto be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are onsite when required for use in the works. The Bills of Quantities shall not be used for the purpose of ordering materials.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>SIGN FOR MATERIALS SUPPLIED.</b></p> <p>The Contractor will be required to sign a receipt for all articles and materials supplied by the PROJECT MANAGER at the time of taking deliver thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacements of any such loss or damage with articles and/or materials which will be supplied by the PROJECT MANAGER at the current market prices including Customs Duty and V.A.T., all at the Contractor's own cost and expense, to the satisfaction of the PROJECT MANAGER</p>		
<p><b>B</b></p>	<p><b>STORAGE OF MATERIALS</b></p> <p>The Contractor shall provide at his own risk and cost where directed on the site weather proof lock-up sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the PROJECT MANAGER Nominated Sub-Contractors are to be made liable for the cost of any storage accommodation provided especially for their use.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p align="center"><b>A</b></p>	<p><b>SAMPLES</b></p> <p>The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete test cubes required for the works that may be called for by the PROJECT MANAGER for his approval until such samples are approved by the PROJECT MANAGER and the PROJECT MANAGER, may reject any materials or workmanship not in his opinion to be up to approved samples. The PROJECT MANAGER shall arrange for the testing of such materials as he may at his discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the PROJECT MANAGER. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by the Ministry of Public Works.</p> <p>The procedure for submitting samples of materials for testing and the method of marking for identification shall be as laid down by the PROJECT MANAGER The Contractor shall allow in his tender for such samples and tests except those in connection with nominated sub-contractors' work.</p>		
<p align="center"><b>B</b></p>	<p><b>GOVERNMENT ACTS REGARDING WORK PEOPLE ETC.</b></p> <p>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. In particular the Contractor's attention is drawn to the provisions of the Factory Act 1950 and his tender 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 so the safety, health and welfare of the workpeople. The Contractor must make himself fully acquainted with current Acts and Regulations, including Police Regulations regarding the movement, housing, security and control of labour, labour camps , passes for transport, etc.</p> <p>No claim in respect of want of knowledge in this connection will be entertained.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>SECURITY OF WORKS ETC.</b></p> <p>The Contractor shall be entirely responsible for the security of all the works stores, materials, plant, personnel, etc., both his own and sub-contractors' 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.</p>		
<p><b>B</b></p>	<p><b>PUBLIC AND PRIVATE ROADS.</b></p> <p>Maintain as required throughout the execution of the works and make good any damage to public or private roads arising from or consequent upon the execution of the works to the satisfaction of the local and other competent authority and the PROJECT MANAGER</p>		
<p><b>C</b></p>	<p><b>VISIT SITE AND EXAMINE DRAWINGS.</b></p> <p>The Contractor is recommended to examine the drawings and visit the site the location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which, may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>ACCESS TO SITE AND TEMPORARY ROADS.</b></p> <p>Means of access to the Site shall be agreed with the PROJECT MANAGER prior to commencement of the work and 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, crossings, bridges, or any other means of gaining access to the Site. Upon completion of the works, the Contractor shall remove such temporary access roads; temporary culverts, bridges, etc., and make good and reinstate all works and surfaces disturbed to the satisfaction of the PROJECT MANAGER</p>		
<p><b>B</b></p>	<p><b>AREA TO BE OCCUPIED BY THE CONTRACTOR</b></p> <p>The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops, etc., shall be defined on site by the PROJECT MANAGER</p>		
<p><b>C</b></p>	<p><b>OFFICE ETC. FOR THE PROJECT MANAGER</b></p> <p>The Contractor shall provide, erect and maintain where directed on site and afterwards dismantle the site office of the type noted in the Particular Preliminaries, complete with Furniture. He shall also provide a strong metal trunk complete with strong hasp and staple fastening and two keys. He shall provide, erect and maintain a lock-up type water or bucket closet for the sole use of the PROJECT MANAGER including making temporary connections to the drain where applicable to the satisfaction of Government and Medical Officer of Health and shall provide services of cleaner and pay all conservancy charges and keep both office and closet in a clean and sanitary condition from commencement to the completion of the works and dismantle and make good disturbed surfaces. The office and closet shall be completed before the Contractor is permitted to commence the works. The Contractor shall make available on the Site as and when required by the "PROJECT MANAGER" a modern and accurate level together with levelling staff, ranging rods and 50 metre metallic or linen tape.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
A	<p><b>WATER AND ELECTRICITY SUPPLY FOR THE WORKS</b></p> <p>The Contractor shall provide at his own risk and cost all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangements for connection to the nearest suitable water main and for metering the water used. He must also provide temporary 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 PROJECT MANAGER . The Contractor shall pay all charges in connection herewith. No guarantee is given or implied that sufficient water will be available from mains and the Contractor must make his own arrangements for augmenting this supply at his own cost. Nominated Sub--contractors are to be made liable for the cost of any water or electric current used and for any installation provided especially for their own use.</p>		
B	<p><b>SANITATION OF THE WORKS</b></p> <p>The Sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Government and/or Local Authorities, Labour Department and the PROJECT MANAGER</p>		
C	<p><b>SUPERVISION AND WORKING HOURS</b></p> <p>The works shall be executed under the direction and to the entire satisfaction in all respects of the PROJECT MANAGER who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and sub-Contractors or other places where work is being prepared for the contract.</p>		
D	<p><b>PROVISIONAL SUMS.</b></p> <p>The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(i) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>PRIME COST (OR P.C.) SUMS.</b></p> <p>The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the Standard Method of Measurement . Persons or firms nominated by the PROJECT MANAGER to execute work or to provide and fix materials or goods are described herein as Nominated Sub-Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.</p>		
<p><b>B</b></p>	<p><b>PROGRESS CHART.</b></p> <p>The Contractor shall provide within two weeks of Possession of Site and in agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Sub-Contractors ; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on Site. Progress to be recorded and chart to be amended as necessary as the work proceeds.</p>		
<p><b>C</b></p>	<p><b>ADJUSTMENT OF P.C. SUMS.</b></p> <p>In the final account all P.C. Sums shall be deducted and the amount properly expended upon the PROJECT MANAGER'S order in respect of each of them added to the Contract sum. The Contractor shall produce to the PROJECT MANAGER such quotations, invoices or bills, properly receipted, as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" (as previously described) following P.C. Sums shall be adjusted pro-rata to the physical extent of the work executed (not pro-rata to the amount paid) and this shall apply even though the Contractor's priced Bill shows a percentage in the rate column in respect of them. Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in these Bill of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a Nominated Sub-Contractor.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<b>A</b>	<p><b>ADJUSTMENT OF PROVISIONAL SUMS.</b></p> <p>In the final account all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such work shall be valued , but should any part of the work be executed by a Nominated Sub-Contractor, the value of such work or articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.</p>		
<b>B</b>	<p><b>NOMINATED SUB-CONTRACTORS</b></p> <p>When any work is ordered by the PROJECT MANAGER to be executed by nominated sub-contractors, the Contractor shall enter into sub-contracts and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractors any or all of the facilities described in these Preliminaries. The Contractor should price for these with the nominated Sub-contract Contractor's work concerned in the P.C. Sums under the description "add for Attendance".</p>		
<b>C</b>	<p><b>DIRECT CONTRACTS</b></p> <p>Notwithstanding the foregoing conditions, the Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum in the priced Bills of Quantities will be adjusted as described for P.C. Sums is allowed.</p>		
	<b>Carried to collection</b>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>ATTENDANCE UPON OTHER TRADESMEN, ETC.</b></p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Contract every facility for carrying out their work and also for use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these Bills.</p>		
<p><b>B</b></p>	<p><b>INSURANCE</b></p> <p>The Contractor shall insure as required in Conditions No. 18 of the Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the PROJECT MANAGER either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing Insurance Clauses have been complied with in all respects. Thereafter the PROJECT MANAGER shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce the receipted premium renewals for the PROJECT MANAGER's inspection.</p>		
<p><b>C</b></p>	<p><b>PROVISIONAL WORK</b></p> <p>All work described as "Provisional" in these Bills of Quantities is subject to remeasurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract shall left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the PROJECT MANAGER Immediately the work is ready for measuring, the Contractor shall give notice to the PROJECT MANAGER. If the Contractor makes default in these respects he shall if the PROJECT MANAGER so directs uncover the work to enable all measurements to be taken and afterwards reinstate at his own expense.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>ALTERATIONS TO BILLS, PRICING, ETC.</b></p> <p>Any unauthorised alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted.</p>		
<p><b>B</b></p>	<p><b>BLASTING OPERATIONS</b></p> <p>Blasting will only be allowed with the express permission of the PROJECT MANAGER in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being, and any special regulations laid down by the PROJECT MANAGER governing the use and storage of explosives.</p>		
<p><b>C</b></p>	<p><b>MATERIALS ARISING FROM EXCAVATIONS</b></p> <p>Materials of any kind obtained from the excavations shall be the property of the Government. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the PROJECT MANAGER. Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
<p><b>A</b></p>	<p><b>PROTECTION OF THE WORKS.</b></p> <p>Provide protection of the whole of the works contained in the Bills of Quantities,including casing , casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which may nevertheless have been done at completion free of cost to the Government.</p>		
<p><b>B</b></p>	<p><b>REMOVAL OF RUBBISH ETC.</b></p> <p>Removal of rubbish and debris from the Buildings and site as it accumulates and at the completion of the works and remove all plant, scaffolding and unused materials at completion.</p>		
<p><b>C</b></p>	<p><b>WORKS TO BE DELIVERED UP CLEAN</b></p> <p>Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings,glass inside and outside and any other parts of the works and remove all marks,blemishes, stains and defects from joinery, fittings and decorated surfaces generally,polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupation to the approval of the PROJECT MANAGER</p>		
<p><b>D</b></p>	<p><b>GENERAL SPECIFICATION.</b></p> <p>For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads and Public Works and Housing General Specification dated 1976 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.</p>		
	<p><b>Carried to collection</b></p>		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
A	<p><b>TRAINING LEVY</b></p> <p>The Contractor's attention is drawn to legal notice No. 237 of October, 1971, which requires payment by the Contractor of a Training Levy at the rate of 1/4 % of the Contract sum on all contracts of more than Kshs. 50,000.00 in value.</p>		
B	<p><b>MATERIALS ON SITE</b></p> <p>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 PROJECT MANAGER. This includes the materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.</p>		
C	<p><b>HOARDING</b></p> <p>The Contractor shall enclose the site or part of the works under construction with a hoarding 2400 mm high consisting of iron sheets on 100 x 50 mm timber posts firmly secured at 1800 mm centres with two 75 x 50 mm timber rails approximately three hundred and fifty metres. The Contractor is in addition required to take all precautions necessary for the safe custody of the works, materials, plant, public and Employer's property on the site.</p>		
D	<p><b>CONTRACTOR'S SUPERINTENDENCE/SITE AGENT</b></p> <p>The Contractor shall constantly keep on the works a literate English speaking Agent or Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the Project Manager and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract.</p>		
	Carried to collection		

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	KSHS	CTS
	<u>COLLECTION</u>		
	Brought Forward From Page GP/1		
	Brought Forward From Page GP/2		
	Brought Forward From Page GP/3		
	Brought Forward From Page GP/4		
	Brought Forward From Page GP/5		
	Brought Forward From Page GP/6		
	Brought Forward From Page GP/7		
	Brought Forward From Page GP/8		
	Brought Forward From Page GP/9		
	Brought Forward From Page GP/10		
	Brought Forward From Page GP/11		
	Brought Forward From Page GP/12		
	Brought Forward From Page GP/13		
	Brought Forward From Page GP/14		
	Brought Forward From Page GP/15		
	<b>TOTAL FOR GENERAL PRELIMINARIES CARRIED TO GRAND SUMMARY</b>		

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## **PREAMBLES AND PRICING NOTES**

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## PREAMBLES AND PRICING NOTES

### **A. GENERALLY**

All work to be carried out in accordance with the Ministry of Public Works General Specifications for Building Works issued in 1976 or as qualified or amended below.

### **B. MANUFACTURERS' NAMES**

Where manufacturers' names and catalogue references are given for guidance to quality and standard only. Alternative manufacturer of equal quality will be accepted at the discretion of the Project Manager.

### **C. WALLING**

All precast concrete blocks shall be manufactured by the methods and to the sizes specified in the Ministry of Public Works "Specification for Metric Sized Concrete Blocks for Building (1972)"

Walling of 100 mm thickness or under shall be reinforced with hoop iron every alternate course.

Prices for walling must allow for all costs in preparing, packing and sending sample blocks for testing as and when required by the Project Manager.

### **D. CARPENTRY**

The grading rules for cypress shall be the same for podocarpus and all timber used for structural work shall be select (second grade).

All structural timber must conform to the minimum requirements for moisture content and preservative treatment and timber prices must allow for preparing, packing and sending samples for testing when required.

Prices must also include for all nails and fasteners.

## **A. JOINERY**

Cypress for joinery shall be second grade in accordance with the latest grading rules of the Kenya Government.

Where Mahogany is specified, this refers to prime grade only. The Contractor may with the approval of the Project Manager; use either Msharagi or Mvuli in lieu of Mahogany but such approval will be given only in the case of shortages of the hardwoods specified.

Plugging shall be carried out by drilling walling or concrete with masonry drill and filling with propriety plugs of the correct sizes. Cutting with hammer and chisel will not be allowed.

Prices for joinery must include for pencil rounded arises, protection against damage, nails, screws, framing and bedding in cement mortar as required.

Sizes given for joinery items are nominal sizes and exact dimensions of doors, etc, must be ascertained on site.

## **B. IRONMONGERY**

Ironmongery shall be specified in the Bills of Quantities or equal and approved.

Prices must include for removing and re-fixing during and after painting, labeling all keys, and for fixing to hardwood, softwood, concrete or blockwork.

Catalogue references given for ironmongery are for purposes of indicating quality and size of item(s). Should the Contractor wish to substitute the specified item(s) with others of equal manufacture, he must inform the Project Manager and obtain approval in writing.

## **C. STRUCTURAL STEELWORK**

All structural steelwork shall comply with the Ministry of Public Works "Structural Steelwork Specification (1973) and shall be executed by an approved Sub-contractor.

**A. PLASTERWORK AND OTHER FINISHES**

All finishing shall be as described in the general specifications and in these Bills of Quantities.

Prices for paving are to include for brushing concrete clean, wetting and coating with cement and sand grout 1:1.

Rates for glazed wall tiling are to include for a 12 mm cement and sand (1:4) backing screed unless otherwise specified in these Bills of Quantities.

**C. GLAZING**

Where polished plate glass is specified, this refers to general glazing quality.

Prices for glazing shall include for priming of rebates before placing putty.

The Contractor will be responsible for replacing any broken or scratched glass and handing over in perfect condition.

**D. PAINTING**

Painting shall be applied in accordance with the manufacturers' instructions.

Prices for painting are to include for scaffolding, preparatory work, priming coats, protection of other works and for cleaning up on completion. Prices for painting on galvanized metal are to include for mordant solution as necessary.

**BUILDER'S WORK**

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><b><u>BUILDERS WORKS</u></b></p> <p><b><u>ELEMENT NO. 1</u></b></p> <p><b><u>DEMOLITIONS AND DOWN TAKINGS</u></b></p> <p><b><u>ALL PROVISIONAL</u></b></p> <p>Tenderers to note the following :-</p> <p>The Tenderer is strongly recommended to visit the site to determine the scope and extent of demolition works to be carried out</p> <p>All salvageable items shall be carefully taken down and removed from site prior to demolition works</p> <p>All material arising out of the demolition and down taking shall become property of the contractor who should allow a credit for all such materials as shown at the end of this section. This should also cover the cost of removal and transportation of such material away from site. The Tenderers must allow a realistic credit value commensurate with the salvaged material. The Quantity Surveyor reserves the right to revalue the credit if in his opinion it is considered to be underpriced</p> <p>The cost of demolition shall include all necessary down taking, taking up all foundations, breaking up concrete floor slabs, ripping up foundations and carting away arising debris. (IMPORTANT NOTE)</p> <p>The cost of any material taken down and later re-used in the contract shall also be adjusted accordingly by the Quantity Surveyor.</p> <p>The Tenderer shall be required to have fully examined and acquainted himself to the present condition of the foregoing down takings and their possible future re-usability. No claims arising out of the Tenderer's lack of knowledge in this respect shall be entertained</p> <p>All debris and materials arising from demolition and down taking shall be removed immediately from site and Tenderer's price should include the cost thereof</p>				

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>DEMOLITIONS AND DOWNTAKING</u></b>				
	<b><u>STRIPPING FINISHES</u></b>				
	<b><u>FLOOR</u></b>				
A	Carefully hack existing ceramic floor tiles on and including cement/sand screed backing and prepare floor to receive another floor finish and cart away debris (Approximately 154 SM).		ITEM		
B	Carefully hack existing non-slip ceramic floor tiles on and including cement/sand screed backing and prepare floor to receive another floor finish and cart away debris (Approximately 387 SM).		ITEM		
	<b><u>WALL</u></b>				
C	Carefully hack existing ceramic wall tiles on and including cement/sand screed backing and prepare floor to receive another floor finish and cart away debris (Approximately 1937 SM).		ITEM		
D	Carefully demolish 100mm thick masonry walling plastered both surfaces and cart away debris (Approximately 105 SM).		ITEM		
	<b><u>DOORS</u></b>				
E	Carefully take down existing 900x2100mm high solid core flush doors faced both sides with 3mm thick ordinary veneer complete with frame and ironmongery and cart away (Approximately 43 NO)		ITEM		
F	Ditto 800x2100mm flush door (Approximately 57 NO)		ITEM		
G	Ditto 2500x2400 double leaf aluminium swing door (Approximately 1 NO)		ITEM		
H	Ditto 1400x2400 double leaf composite door (Approximately 61 NO)		ITEM		
	<b><u>LOW LEVEL CABINETS</u></b>				
J	Carefully demolish existing 600mm deep x900mm high low level kitchen cupboards comprising suspended concrete worktop,MDF doors and drawers,MDF Shelves,divisions and cart away debris (Approximately 16 M).		ITEM		
	<b>Total Carried to collection</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>HIGH LEVEL CABINETS</u></p> <p>Carefully demolish existing 300mm deep x 600mm high level kitchen cupboards comprising MDF doors, Shelves,sides,divisions and cart away debris (Approximately 16 M).</p>		ITEM		
B	<p><u>CEILING FINISHES</u></p> <p>Carefully sand down the existing T&amp;G ceiling comprising Timber strips on timber brandery and cart away debris (Approximately 112 SM).</p>		ITEM		
<b>Total Carried to collection</b>				<b>KSHS</b>	
	<p><u>Collection</u></p> <p>Brought forward from page 2</p> <p>Brought forward from above</p>				
<b>TOTAL FOR DEMOLITION AND DOWNTAKING CARRIED TO SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO. 2</u>				
	<u>DOORS</u>				
	<u>FRAMELESS GLASS DOOR</u>				
A	10mm thick toughened frosted frameless glass sliding automated door overall size 2500x3000mm high complete with frame,locks,handles and all necessary ironmongery	1	NO		
	<u>COMPOSITE DOORS</u>				
	<u>Supply and fix composite double leaf door complete with 150x50 mm wrot cypress frames, 8 mm thick frosted georgian glass , stainless steel satin handle and all necessary ironmongery</u>				
B	Door overall size 1400 mm wide x 2400mm high	61	NO		
	<u>DUCT DOORS</u>				
	<u>Supply and fix 45mm thick mahogany louvered timber door size 1000x2100 mm complete with 150x50 mm frame 12mm hardwood louveres fixed at 45 degrees complete with 15x10mm hardwood beading all round and all necessary ironmongery</u>				
C		20	NO		
	<u>FLUSH DOOR</u>				
	<u>50 mm Thick flush doors to B.S. 459 part 2: mahogany veneered both sides: hardwood lipped edges:</u>				
D	Door overall size 800 mm wide x 2100mm high	57	NO		
E	Ditto Door overall size 900 mm wide x 2100mm high	43	NO		
	<u>Door frame and finishing in wrought cypress</u>				
F	150 x 50 mm Frames: Three labours: plugged	608	LM		
G	150 x 50 mm Transoms	80	LM		
H	50 x 25 mm Architrave: screwed to frame and pellated	608	LM		
J	25 x 25 mm Quadrant beading: one labour: ditto	608	LM		
K	10 x 20 mm Glazing beads	220	LM		
	<b>Total Carried to collection</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<u>4 mm Clear sheet fanlight glass and glazing to timber with beads ( measured separately )</u> In panes not exceeding 0.1 square metres	24	SM		
	<u>PAINT AND DECORATION</u>				
B	<u>Prepare and apply one coat aluminium wood primer: before fixing: on wood: to</u> Surfaces not exceeding 100 mm girth	828	LM		
C	Ditto: over 100 but not exceeding 200 mm girth	1296	LM		
	<u>Prepare and apply one undercoat and three finishing coats of premium grade polyurethane stained varnish: on wood: to</u>				
D	Doors: general timber surfaces	463	SM		
E	Frames: over 100 but not exceeding 200 mm girth	608	LM		
F	Transomes: ditto	80	LM		
G	Architraves: not exceeding 100 mm girth	608	LM		
H	Quadrant beading : not exceeding 100 mm girth	608	LM		
J	Glazing beads: ditto	220	LM		
	<u>Prepare and apply one undercoat and two finishing coats first grade polyurethane clear varnish on wood surfaces</u>				
K	Surfaces not exceeding 100mm girth	124	SM		
L	Frames: over 100 but not exceeding 200mm girth	124	SM		
M	Doors: general timber surfaces	84	SM		
	<u>Supply and fix the following ironmongery to timber complete with matching screws and keys as per 'UNION' manufacturers ( reference to a particular catalogue are given as a guide to type and quality only, other equal and approved alternatives may be used)</u>				
N	100mm brass butt hinges	72	PRS		
P	Polished Brass 2-Lever mortice door lock and furniture set (keyhole escutcheons, cylinder & latch) ; reference to 'UNION' catalogue number 2277PB	95	NO		
	<b>Total Carried to Collection</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	38 mm diameter satin anodized aluminium door stop;rawl bolted to floor or wall; reference to UNION catalogue number DS-01AS	41	NO		
<b>Total Carried to Collection</b>				<b>KSHS</b>	
<p><u>Collection</u></p> <p>Brought forward from Page 4</p> <p>Brought forward from Page 5</p> <p>Brought forward above</p>					
<b>TOTAL FOR DOORS CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO. 3</u>				
	<u>FLOOR FINISHES</u>				
	<u>Cement and sand (1:4) screeded beds: on concrete: to</u>				
A	32 mm Thick floors: finished to receive non-slip ceramic floor tiles	387	SM		
B	30 mm Thick floors: finished to receive granite floor finish	179	SM		
	<u>Supply and fix 300 x 600 x 8mm Thick non slip ceramic floor tiles as supplied by M/s Saj Ceramics or equal and approved : on screeded beds(m/s); bedded and jointed in waterproof cement grout: to</u>				
C	Floors horizontal	387	SM		
	<u>Supply and fix 1200 x 600 x 10mm granite floor finish as supplied by tile and carpet or equal and approved : on screeded beds(m/s); bedded and jointed in waterproof cement grout: to</u>				
D	Floors horizontal	112	SM		
E	10 mm Thick x 150 mm high skirting with rounded top	83	LM		
	<u>Supply and fix 500 x 500 x 10mm Thick granito floor tiles as supplied by M/s Saj Ceramics or equal and approved : on screeded beds(m/s); bedded and jointed in waterproof cement grout: to</u>				
F	Floors horizontal	67	SM		
G	10 mm Thick x 150 mm high skirting with rounded top	104	LM		
	<b>Total Carried to Collection</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>WATER PROOFING</u></b>				
A	30mm thick screed backing to receive interlocking floor tiles	84	SM		
B	Supply and fix 32mm thick mastic asphalt tanking to floors horizontal as directed by the architect	84	SM		
C	Supply and fix interlocking concrete tiles size 400x250x25mm to floor horizontal as directed by the architect	84	SM		
	<u>Carefully clean existing floor surface using hydrochloric acid, grind and polish terrazzo as directed</u>				
D	To floors horizontal	1082	SM		
E	10 mm Thick x 150 mm high skirting with rounded top	72	LM		
<b>Total Carried to Collection</b>				<b>KSHS</b>	
	<u>Collection</u> Brought forward from Page 7 Brought forward above				
<b>TOTAL FOR FLOOR FINISHES CARRIED TO BUILDERS WORKS</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>ELEMENT NO. 4</u></p> <p><u>WALLING</u></p> <p><u>100mm thick machine dressed stone blocks jointed with mortar cement and sand (1:4) reinforced with hoop iron after every alternate courses</u></p> <p>To walls vertical; internal</p>	105	SM		
<b>TOTAL FOR WALL FINISHESCARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b>ELEMENT NO. 4</b>				
	<b>WALL FINISHES</b>				
	<u>INTERNAL WALL FINISHES</u> <u>Carefully allow for all necessary repairs including for</u> <u>thoroughly scrubbing down with wire brush; in filling cracks</u> <u>with approved filler material and preparing surfaces to</u> <u>receive new paint.</u>				
A	Walls	2856	SM		
B	Ditto: Reveals	107	SM		
	<u>12 mm Cement and sand (1:4) backings: on concrete or</u> <u>masonry surface: to</u>				
C	To Walls vertical: internal	1937	SM		
	<u>Supply and fix 250 x 500 x 8 mm Thick ceramic wall tiles as</u> <u>supplied by M/s Saj Ceramics or equal and approved : on</u> <u>screeded beds(m/s); bedded and jointed in waterproof</u> <u>cement grout: to</u>				
D	To Walls vertical: internal	1937	SM		
	<u>Prepare and apply one undercoat and two coats premium</u> <u>grade silk vinyl emulsion paint with teflon surface protector</u> <u>as supplied by Crown paints: on plastered surfaces: to</u>				
E	To Walls vertical: internal	2856	SM		
F	Ditto: reveals	107	SM		
	<u>Prepare and apply one undercoat and two coats of premium</u> <u>grade acrylic emulsion based textured finish as supplied by</u> <u>Crown paints: on plastered surfaces: to</u>				
G	To Walls vertical: internal	155	SM		
<b>TOTAL FOR WALL FINISHES CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 5</u></b>				
	<b><u>CEILING FINISHES</u></b>				
	<u>Wrought mahogany treated; selected and kept clean; allow for scarf joints</u>				
A	100 x 25mm T&G wrot mahogany or equal and approved hardwood timber ceiling; allow for sanding and polishing in ceiling	112	SM		
	<u>9mm gypsum board fixed to GI egg crate framework suspended from concrete slab with joints taped and skimmed with gypsum plaster including forming and curved cuttings and shadow gap edge trims to wall and ceiling abutments</u>				
B	Bulkhead	43	SM		
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
C	Ceiling; soffits	2368	SM		
	<b><u>PAINTING AND DECORATING</u></b>				
	<u>Prepare and apply one undercoat and two finishing coats of first grade vinyl matt emulsion paint or other equal and approved paint; on</u>				
D	Soffits and sides of bulkhead	43	SM		
E	Ditto soffits of slab	2368	SM		
	<b><u>T&amp;G CEILING</u></b>				
F	Prepare and apply three finishing coats of premium quality clear varnish to soffits of ceiling	782	SM		
<b>TOTAL FOR CEILING FINISHES CARRIED TO BUILDERS WORKS</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 6</u></b>				
	<b><u>STAIRS AND ASSOCIATED FINISHES</u></b>				
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
A	To Soffits of landing and waist	147	SM		
B	To balustrading	220	SM		
	<b><u>PAINTING AND DECORATING</u></b>				
	<u>Prepare and apply one undercoat and two finishing coats of first grade vinyl matt emulsion paint or other equal and approved paint; on</u>				
C	To Soffits of landing and waist	147	SM		
	<u>Prepare and apply one primer coat and two finishing coats of gloss paint or other equal and approved paint; on</u>				
D	To balustrading	220	SM		
	<u>Prepare and apply one undercoat and two finishing coats first grade polyurethane clear varnish on wood surfaces</u>				
E	To handrail	147	LM		
	<u>Carefully clean existing floor surfaces using hydrochloric acid , grind and polish terrazzo as directed</u>				
F	To landing	69	SM		
G	To risers	541	LM		
H	To treads	528	LM		
<b>TOTAL FOR STAIRS FINISHES CARRIED TO BUILDERS WORKS</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO.7</u>				
	<u>JOINERY FITTINGS</u>				
	<u>SHELVES, LOW,HIGH LEVEL AND STORAGE CABINET</u>				
	<u>Prime grade sawn cypress</u>				
A	50 x 50 mm plinth	170	LM		
B	50 x 25mm Bearer	170	LM		
C	25mm Thick Block Board with screwed joints to cabinet top	20	SM		
	<u>Granite work top</u>				
D	20 mm thick Black Marble (to match company colours) to work top with 10mm half round edge glued to mdf board base (m/s)	20	SM		
	<u>18mm Thick MDF in approved laminate in Cabinet shelves,top,bottom, sides and approved normal laminated MDF to doors with lipping;with screwed joints to cabinet</u>				
E	Laminated MDF to top	64	SM		
F	Laminated MDF to sides	216	SM		
G	Laminated MDF to mid shelves	66	SM		
H	Laminated MDF to bottom	70	SM		
	<u>9mm thick MDF to cabinet doors</u>				
J	Laminated MDF to back	210	SM		
	<u>18mm thick MDF to cabinet doors</u>				
K	Door size 500 x 900 mm overall	30	NO		
L	Door size 550 x 900 mm overall	20	NO		
M	Door size 458 x 800 mm overall	70	NO		
N	Door size 500 x 2400 mm overall	60	NO		
	<b>Total Carried to Collection</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>SUPPLY AND FIX ONLY the following ironmongery to Architect's approval</u>				
A	Malpine hinges	540	PAIRS		
B	Door pull handle	180	NO		
	<u>20mm thick MDF to cabinet doors</u>				
C	Door size 600 x 900 mm overall	34	NO		
	<u>Prepare and apply one primer coat and two finishing coats of gloss paint or other equal and approved paint; on</u>				
D	To steel frames	86	SM		
<b>Total Carried to Collection</b>				<b>KSHS</b>	
	<u>COLLECTION</u> Brought forward from Page 13 Brought forward above				
<b>TOTAL FOR JOINERY FITTINGS CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
<b>BUILDERS WORK SUMMARY</b>					
1	DEMOLITIONS				
2	DOORS				
3	FLOOR FINISHES				
4	WALL FINISHES				
5	CEILING FINISHES				
6	STAIRS				
7	JOINERY FITTINGS				
<b>TOTAL ESTIMATED COST CARRIED TO GRAND SUMMARY</b>					

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><b><u>BUILDERS WORKS</u></b></p> <p><b><u>ELEMENT NO. 1</u></b></p> <p><b><u>DEMOLITIONS AND DOWN TAKINGS</u></b></p> <p><b><u>ALL PROVISIONAL</u></b></p> <p>Tenderers to note the following :-</p> <p>The Tenderer is strongly recommended to visit the site to determine the scope and extent of demolition works to be carried out</p> <p>All salvageable items shall be carefully taken down and removed from site prior to demolition works</p> <p>All material arising out of the demolition and down taking shall become property of the contractor who should allow a credit for all such materials as shown at the end of this section. This should also cover the cost of removal and transportation of such material away from site. The Tenderers must allow a realistic credit value commensurate with the salvaged material. The Quantity Surveyor reserves the right to revalue the credit if in his opinion it is considered to be underpriced</p> <p>The cost of demolition shall include all necessary down taking, taking up all foundations, breaking up concrete floor slabs, ripping up foundations and carting away arising debris. (IMPORTANT NOTE)</p> <p>The cost of any material taken down and later re-used in the contract shall also be adjusted accordingly by the Quantity Surveyor.</p> <p>The Tenderer shall be required to have fully examined and acquainted himself to the present condition of the foregoing down takings and their possible future re-usability. No claims arising out of the Tenderer's lack of knowledge in this respect shall be entertained</p> <p>All debris and materials arising from demolition and down taking shall be removed immediately from site and Tenderer's price should include the cost thereof</p>				
	<b><u>DEMOLITIONS AND DOWNTAKING</u></b>				

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>STRIPPING FINISHES</u></p> <p><u>FLOOR</u></p> <p>Carefully remove existing linoleum floor tiles on and including cement/sand screed backing and prepare floor to receive another floor finish and cart away debris (Approximately 705 SM).</p>		ITEM		
B	<p><u>WALL</u></p> <p>Carefully sand existing varnished partition walls and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 513SM).</p>		ITEM		
C	<p>Carefully sand existing varnished doors, frames, architraves, quadrants transomes etc and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 32 no. 900x2400, 1no. 1400x2400).</p>		ITEM		
	<b>TOTAL FOR DEMOLITION AND DOWNTAKING CARRIED TO SUMMARY</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 3</u></b>				
	<b><u>DOORS</u></b>				
	<b><u>PAINT AND DECORATION</u></b>				
	<u>Prepare and apply one undercoat ,two finishing coats first grade oil stained varnish: on wood: to</u>				
A	Doors: general timber surfaces	128	SM		
B	Frames: over 100 but not exceeding 200 mm girth	189	LM		
C	Transomes: ditto	30	LM		
D	Architraves: not exceeding 100 mm girth	189	LM		
E	Quadrant beading : not exceeding 100 mm girth	189	LM		
F	Glazing beads: ditto	80	LM		
	<b><u>IRONMONGERY</u></b>				
	<u>Supply and fix the following ironmongery to timber complete with matching screws and keys as per 'UNION' manufacturers ( reference to a particular catalogue are given as a guide to type and quality only, other equal and approved alternatives may be used)</u>				
G	100 mm Brass butt hinges	26	PRS		
H	Polished Brass 2-Lever mortice door lock and furniture set (keyhole escutcheons, cylinder & latch) ; reference to 'UNION' catalogue number 2277PB	17	NO		
J	38 mm diameter satin anodized aluminium door stop;rawl bolted to floor or wall; reference to UNION catalogue number DS-01AS	17	NO		
<b>TOTAL FOR DOORS CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 4</u></b>				
	<b><u>FINISHES</u></b>				
	<b><u>FLOOR FINISHES</u></b>				
	<u>Cement and sand (1:4) screeded beds: on concrete: to</u>				
A	30 mm Thick floors: finished to receive granito floor tiles	705	SM		
	<u>Supply and fix 500 x 500 x 10mm Thick granito floor tiles as supplied by M/s Saj Ceramics or equal and approved : on screeded beds(m/s); bedded and jointed in waterproof cement grout: to</u>				
B	Floors horizontal	705	SM		
C	10 mm Thick x 150 mm high skirting with rounded top	579	LM		
	<b><u>WALL FINISHES</u></b>				
	<b><u>INTERNAL WALL FINISHES</u></b>				
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
D	To Walls vertical;internal	320	SM		
E	Ditto: Reveals	64	SM		
	<u>Prepare and apply one undercoat and two coats premium grade silk vinyl emulsion paint with teflon surface protector as supplied by Crown paints: on plastered surfaces: to</u>				
F	To Walls vertical;internal	320	SM		
G	Ditto: Reveals	64	SM		
	<u>Prepare and apply one undercoat, two finishing coats first grade Polyurethane Clear varnish (gloss) to</u>				
H	To partition walls vertical;internal	513	SM		
	<b><u>CEILING</u></b>				
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
J	To Ceilings internally	705	SM		
	<b>TOTAL FOR FINISHES CARRIED TO BUILDERS WORKS SUMMARY</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
<b>BUILDERS WORK SUMMARY</b>					
1	DEMOLITIONS				
2	DOORS				
3	FINISHES				
<b>TOTAL ESTIMATED COST CARRIED TO GRAND SUMMARY</b>					

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><b><u>BUILDERS WORKS</u></b></p> <p><b><u>ELEMENT NO. 1</u></b></p> <p><b><u>DEMOLITIONS AND DOWN TAKINGS</u></b></p> <p><b><u>ALL PROVISIONAL</u></b></p> <p>Tenderers to note the following :-</p> <p>The Tenderer is strongly recommended to visit the site to determine the scope and extent of demolition works to be carried out</p> <p>All salvageable items shall be carefully taken down and removed from site prior to demolition works</p> <p>All material arising out of the demolition and down taking shall become property of the contractor who should allow a credit for all such materials as shown at the end of this section. This should also cover the cost of removal and transportation of such material away from site. The Tenderers must allow a realistic credit value commensurate with the salvaged material. The Quantity Surveyor reserves the right to revalue the credit if in his opinion it is considered to be underpriced</p> <p>The cost of demolition shall include all necessary down taking, taking up all foundations, breaking up concrete floor slabs, ripping up foundations and carting away arising debris. (IMPORTANT NOTE)</p> <p>The cost of any material taken down and later re-used in the contract shall also be adjusted accordingly by the Quantity Surveyor.</p> <p>The Tenderer shall be required to have fully examined and acquainted himself to the present condition of the foregoing down takings and their possible future re-usability. No claims arising out of the Tenderer's lack of knowledge in this respect shall be entertained</p> <p>All debris and materials arising from demolition and down taking shall be removed immediately from site and Tenderer's price should include the cost thereof</p>				
	<b><u>DEMOLITIONS AND DOWNTAKING</u></b>				

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>STRIPPING FINISHES</u></p> <p><u>FLOOR</u></p> <p>Carefully remove existing linoleum floor tiles on and including cement/sand screed backing and prepare floor to receive another floor finish and cart away debris (Approximately 705 SM).</p>		ITEM		
B	<p><u>WALL</u></p> <p>Carefully sand existing varnished partition walls and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 561SM).</p>		ITEM		
C	<p>Carefully sand existing varnished doors, frames, architraves, quadrants transomes etc and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 32 no. 900x2400, 1no. 1400x2400).</p>		ITEM		
	<b>TOTAL FOR DEMOLITION AND DOWNTAKING CARRIED TO SUMMARY</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 3</u></b>				
	<b><u>DOORS</u></b>				
	<b><u>PAINT AND DECORATION</u></b>				
	<u>Prepare and apply one undercoat ,two finishing coats first grade oil stained varnish: on wood: to</u>				
A	Doors: general timber surfaces	128	SM		
B	Frames: over 100 but not exceeding 200 mm girth	189	LM		
C	Transomes: ditto	30	LM		
D	Architraves: not exceeding 100 mm girth	189	LM		
E	Quadrant beading : not exceeding 100 mm girth	189	LM		
F	Glazing beads: ditto	80	LM		
	<b><u>IRONMONGERY</u></b>				
	<u>Supply and fix the following ironmongery to timber complete with matching screws and keys as per 'UNION' manufacturers ( reference to a particular catalogue are given as a guide to type and quality only, other equal and approved alternatives may be used)</u>				
G	100 mm Brass butt hinges	26	PRS		
H	Polished Brass 2-Lever mortice door lock and furniture set (keyhole escutcheons, cylinder & latch) ; reference to 'UNION' catalogue number 2277PB	17	NO		
J	38 mm diameter satin anodized aluminium door stop;rawl bolted to floor or wall; reference to UNION catalogue number DS-01AS	17	NO		
<b>TOTAL FOR DOORS CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 4</u></b>				
	<b><u>FINISHES</u></b>				
	<b><u>FLOOR FINISHES</u></b>				
	<u>Cement and sand (1:4) screeded beds: on concrete: to</u>				
A	30 mm Thick floors: finished to receive granito floor tiles	705	SM		
	<u>Supply and fix 500 x 500 x 10mm Thick granito floor tiles as supplied by M/s Saj Ceramics or equal and approved : on screeded beds(m/s); bedded and jointed in waterproof cement grout: to</u>				
B	Floors horizontal	705	SM		
C	10 mm Thick x 150 mm high skirting with rounded top	579	LM		
	<b><u>WALL FINISHES</u></b>				
	<b><u>INTERNAL WALL FINISHES</u></b>				
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
D	To Walls vertical;internal	320	SM		
E	Ditto: Reveals	64	SM		
	<u>Prepare and apply one undercoat and two coats premium grade silk vinyl emulsion paint with teflon surface protector as supplied by Crown paints: on plastered surfaces: to</u>				
F	To Walls vertical;internal	320	SM		
G	Ditto: Reveals	64	SM		
	<u>Prepare and apply one undercoat, two finishing coats first grade Polyurethane Clear varnish (gloss) to</u>				
H	To partition walls vertical;internal	561	SM		
	<b><u>CEILING</u></b>				
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
J	To Ceilings internally	705	SM		
	<b>TOTAL FOR FINISHES CARRIED TO BUILDERS WORKS SUMMARY</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
<b>BUILDERS WORK SUMMARY</b>					
1	DEMOLITIONS				
2	DOORS				
3	FINISHES				
<b>TOTAL ESTIMATED COST CARRIED TO GRAND SUMMARY</b>					

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<p><b><u>BUILDERS WORKS</u></b></p> <p><b><u>ELEMENT NO. 1</u></b></p> <p><b><u>DEMOLITIONS AND DOWN TAKINGS</u></b></p> <p><b><u>ALL PROVISIONAL</u></b></p> <p>Tenderers to note the following :-</p> <p>The Tenderer is strongly recommended to visit the site to determine the scope and extent of demolition works to be carried out</p> <p>All salvageable items shall be carefully taken down and removed from site prior to demolition works</p> <p>All material arising out of the demolition and down taking shall become property of the contractor who should allow a credit for all such materials as shown at the end of this section. This should also cover the cost of removal and transportation of such material away from site. The Tenderers must allow a realistic credit value commensurate with the salvaged material. The Quantity Surveyor reserves the right to revalue the credit if in his opinion it is considered to be underpriced</p> <p>The cost of demolition shall include all necessary down taking, taking up all foundations, breaking up concrete floor slabs, ripping up foundations and carting away arising debris. (IMPORTANT NOTE)</p> <p>The cost of any material taken down and later re-used in the contract shall also be adjusted accordingly by the Quantity Surveyor.</p> <p>The Tenderer shall be required to have fully examined and acquainted himself to the present condition of the foregoing down takings and their possible future re-usability. No claims arising out of the Tenderer's lack of knowledge in this respect shall be entertained</p> <p>All debris and materials arising from demolition and down taking shall be removed immediately from site and Tenderer's price should include the cost thereof</p>				
	<b><u>DEMOLITIONS AND DOWNTAKING</u></b>				

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>STRIPPING FINISHES</u>				
	<u>FLOOR</u>				
A	Carefully remove existing carpet floor finish and prepare floor to receive another floor finish and cart away debris as directed (Approximately 560 SM).		ITEM		
B	Carefully remove existing floor tiles on and including cement/sand screed backing and prepare floor to receive another floor finish and cart away debris (Approximately 150 SM).		ITEM		
	<u>WALL</u>				
C	Carefully sand existing varnished partition walls and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 423SM).		ITEM		
D	Carefully sand existing varnished T&G ceiling and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 704SM).		ITEM		
E	Carefully take down existing aluminium framed glass partition and make good disturbed surfaces, cart away debris as directed (Approximately 18 SM).		ITEM		
F	Carefully remove existing timber reception counter and make good disturbed surfaces, cart away debris as directed (Approximately 3no).		ITEM		
G	Carefully sand existing varnished doors and prepare surfaces to receive new varnish and cart away debris as directed (Approximately 21 no. 900x2400, 5n0. 1400x2400).		ITEM		
<b>TOTAL FOR DEMOLITION AND DOWNTAKING CARRIED TO SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO. 2</u>				
	<u>PARTITIONING</u>				
	<u>FRAMELESS GLASS PARTITION</u>				
A	10mm thick toughened frosted frameless glass partition complete with 50mm stainless steel framework glued with silicon and bolted connections,locks,handles and all necessary ironmongery	31	SM		
B	Ditto doors overall size 900x2100 including locks,handles and all necessary ironmongery	3	NO		
	<u>Ironmongery</u>				
C	Frameless glass hinge	4.5	PRS		
D	stainless steel handles	6	NO		
E	door stop	3	NO		
F	door closer - soft closer mechanism	3	NO		
<b>TOTAL FOR PARTITIONING CARRIED TO SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>ELEMENT NO. 3</u></b>				
	<b><u>DOORS</u></b>				
	<b><u>PAINT AND DECORATION</u></b>				
	<u>Prepare and apply one undercoat ,two finishing coats first grade oil stained varnish: on wood: to</u>				
A	Doors: general timber surfaces	85	SM		
B	Frames: over 100 but not exceeding 200 mm girth	151	LM		
C	Transomes: ditto	26	LM		
D	Architraves: not exceeding 100 mm girth	151	LM		
E	Quadrant beading : not exceeding 100 mm girth	151	LM		
F	Glazing beads: ditto	67	LM		
	<b><u>IRONMONGERY</u></b>				
	<u>Supply and fix the following ironmongery to timber complete with matching screws and keys as per 'UNION' manufacturers ( reference to a particular catalogue are given as a guide to type and quality only, other equal and approved alternatives may be used)</u>				
G	100 mm Brass butt hinges	24	PRS		
H	Polished Brass 2-Lever mortice door lock and furniture set (keyhole escutcheons, cylinder & latch) ; reference to 'UNION' catalogue number 2277PB	13	NO		
J	38 mm diameter satin anodized aluminium door stop;rawl bolted to floor or wall; reference to UNION catalogue number DS-01AS	15	NO		
<b>TOTAL FOR DOORS CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<u>ELEMENT NO. 4</u>				
	<u>FINISHES</u>				
	<u>FLOOR FINISHES</u>				
	<u>Cement and sand (1:4) screeded beds: on concrete: to</u>				
A	30 mm Thick floors: finished to receive granito floor tiles	520	SM		
	<u>Supply and fix 500 x 500 x 10mm Thick granito floor tiles as supplied by M/s Saj Ceramics or equal and approved : on screeded beds(m/s); bedded and jointed in waterproof cement grout: to</u>				
B	Floors horizontal	520	SM		
C	10 mm Thick x 150 mm high skirting with rounded top	271	LM		
	<u>Carpet</u>				
	<u>12mm thick approved jute-backed carpet to K.S 08779:1998 comprising: 80% wool; 20% synthetic fused in woven textile backing, stain resistant, fade resistant; soiling treated permanently anti-static standard carpet complete with aluminium fixing clips metal grippers, approved adhesive : all fixed in accordance with the manufacturer's instructions</u>				
D	Floors horizontal	190	SM		
	<u>Underlay</u>				
E	5mm thick approved polythene foam underlay as jumbolene floor underlay or other equal and approved	190	SM		
	<u>wrot mahogany skirting</u>				
F	100 mm x 20 mm high skirting with rounded top	90	LM		
	<b>Total Carried to collection</b>			<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	<b><u>WALL FINISHES</u></b>				
	<b><u>INTERNAL WALL FINISHES</u></b>				
	<u>Carefully allow for all necessary repairs including for thoroughly scrubbing down with wire brush; in filling cracks with approved filler material and preparing surfaces to receive new paint.</u>				
A	To Walls vertical;internal	320	SM		
B	Ditto: Reveals	64	SM		
	<u>Prepare and apply one undercoat and two coats premium grade silk vinyl emulsion paint with teflon surface protector as supplied by Crown paints: on plastered surfaces: to</u>				
C	To Walls vertical;internal	320	SM		
D	Ditto: Reveals	64	SM		
	<u>Prepare and apply one undercoat, two finishing coats first grade Polyurethane Clear varnish (gloss) to</u>				
E	To partition walls vertical;internal	423	SM		
	<b><u>T &amp; G CEILING</u></b>				
F	Prepare and apply three finishing coats of premium quality clear varnish to soffits of ceiling	670	SM		
<b>Total Carried to collection</b>				<b>KSHS</b>	
	<u>Collection</u>				
	total brought forward from page 5				
	total brought forward from above				
<b>TOTAL FOR FINISHES CARRIED TO BUILDERS WORKS SUMMARY</b>				<b>KSHS</b>	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
A	<p><u>ELEMENT NO.5</u></p> <p><u>JOINERY FITTINGS</u></p> <p><u>Reception Counter</u></p> <p>Provide a provisional sum for supply and installation of mahogany reception counters approximate size 1800mm x 800mm x 1200mm high to architects design and approval</p>	3	NO		
	<p><b>TOTAL FOR JOINERY FITTINGS CARRIED TO BUILDERS WORKS SUMMARY</b></p>			KSHS	

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
<b>BUILDERS WORK SUMMARY</b>					
1	DEMOLITIONS				
2	DOORS				
3	FINISHES				
4	JOINERY FITTINGS				
<b>TOTAL ESTIMATED COST CARRIED TO GRAND SUMMARY</b>					



**MECHANICAL WORKS**

SECTION A

GENERAL MECHANICAL SPECIFICATIONS

## SECTION A

### GENERAL MECHANICAL SPECIFICATION

<u>CLAUSE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
2.01	GENERAL	A-1
2.02	QUALITY OF MATERIALS	A-1
2.03	REGULATIONS AND STANDARDS	A-1
2.04	ELECTRICAL REQUIREMENTS	A -2
2.05	TRANSPORT AND STORAGE	A -2
2.06	SITE SUPERVISION	A -3
2.07	INSTALLATION	A -3
2.08	TESTING	A -3
2.09	COLOUR CODING	A -4
2.10	WELDING	A -5

## SECTION D

### 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.

#### 1. 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.
- a) 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 minimise 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 week's 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:

#### a) Pipe Welding

All pipe welds shall be carried out in accordance with the requirements of B.S.806.

#### b) General Welding

All welding of mild steel components other than pipework shall comply with the general requirements of B.S. 1856.

### 2.10.4 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 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 SPECIFICATIONS  
FOR  
PLUMBING AND DRAINAGE**

## SECTION B

### PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

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## SECTION E

### PARTICULAR SPECIFICATIONS FOR PLUMBING AND DRAINAGE

#### 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 fittings 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.

c) **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.

d) **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 Littlehampton, Sussex, England.

The trade name 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 pipeangers, 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	Copper Tube to B.S. 659	Steel Tube to B.S. 1387
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 rodding 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.

c) 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.

## 1.1. 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 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 sterilised 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.

**SECTION C**  
**SPECIFICATIONS FOR MECHANICAL**  
**VENTILATION SYSTEMS**

## GENERAL SPECIFICATION FOR MECHANICAL VENTILATION INSTALLATIONS

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# **GENERAL SPECIFICATION FOR MECHANICAL VENTILATION INSTALLATIONS**

## **1.0 SCOPE OF WORK**

The scope of the works comprises Installation, Testing, and Commissioning of Mechanical Ventilation and Air Conditioning systems in accordance with Specifications and drawings.

All the necessary elements and details for complete system are to be included. Excluded from the specifications are the following:-

- All concrete works
- All block work
- Electrical wiring, isolators and switch boards, except internal wiring for control system from a local isolator.

## **2.0 SYSTEM COMPONENTS**

Dimensions and capacities of ducts and fans are calculated and based on a specific requirements of air, and on an assumed resistance through grilles, silencers etc. However the installer shall be responsible for the correct functioning of the system. Subsequently it is therefore his duty to size the systems' components with consideration to his offered equipment.

## **3.0 DRAWINGS**

The Engineer's drawings show the main layout and principles for the Ventilation and Air Conditioning Systems. If need for further detailing is required in order to carry out the work, working drawings and details shall be produced for approval by the Engineer before the work is executed.

In preparation of the working drawings care should be taken to coordinate the Ventilation and Air Conditioning works with other services involved and avoid any interference with these.

## **4.0 MATERIALS AND WORKMANSHIP GENERALLY**

In the specification, equipment is generally described according to capacities and a given standard in order to aid in identification of the particular equipment to satisfy specifications. The equipment selected shall be of reputable manufacture with adequate Back-Up service.

If the Engineer finds it necessary, samples of the materials will be submitted for approval before placing an order. The Engineer shall reject any materials which he finds to be of unsatisfactory quality.

Works shall be carried out by competent workmen under experienced supervision. The Engineer shall have the authority to have any substandard work or equipment redone and/ or equipment replaced.

## **5.0 DUCTWORK GENERALLY**

### **5.1 Ductwork**

All seams, joints and connections to plant shall be so made as to reduced air leakage to a minimum. Internal roughness and obstructions to airflow will not be accepted. Sharp edges or corners on the outside of ductwork, flanges, supports, etc will not be accepted. Any part of galvanized ductwork where the galvanizing is damaged during manufacture or erection shall be painted with two coats of aluminum, zinc or other corrosion – resisting paint to the approval of the Engineer.

Where ducts pass through roofs (and external walls where applicable) these shall be fitted with angle flanges and weather cravats to ensure a weather-proof fitting to the building structure.

Connections to equipment shall be made with angle flanged joints. Ductwork which may have to be moved to enable plant to be removed shall incorporate angle flanged joints. For long duct runs, angle flanged joints shall be included at intervals to facilitate any subsequent alternations.

Bends and offsets shall have a minimum throat radius equal to the width of the duct. Where short radius elbows are indicated or agreed by the Engineer as necessary due to site limitations the dimensions and internal vane (s) shall be in accordance with HVCA publication DW/121.

Ductwork shall be constructed by galvanized, cold rolled, close annealed patent flattened sheets. Tests ho

les shall be provided in branch ducts from grilles and there shall be three or four tests holes on side of duct according to duct depth at each test position. At branch positions there shall be one test hole. Air tight swivel type metal covers shall be fitted over the test holes in such a manner that they shall be readily removed as required.

### **5.2 Rectangular ductwork**

Construction of ductwork shall be as per the following Guidelines:

- Up to 300mm longer side – 22 S.W.G.
- Over 300mm and up to 460mm longer size – 20 S.W.G.

- over 460mm and up to 900mm longer side 18 S.W.G (stiffening to be 25mm x 25mm x 3mm. M.S angle at slip joints at 180mm spacing)
- Over 900mm and up to 1370mm. longer side 16 S.W.G. (stiffening to be 30mm x 30mm x 3mm M.S angle at 900mm spacing).
- Over 1370mm longer side – 14 S.W.G. (Stiffening to be 40mm x 40mm x 5mm M.S angle at 900mm. spacing).

Ductwork constructed from 22 and 20 S.W.G sheet shall have folded locked seams and ductwork constructed from 18, 16 and 14 S.W.G. sheets shall have riveted seam with 8 S.W.G rivets at 2” pitch.

Joints for ductwork having a side greater in width than 610mm shall be flanged by means of 30mm x 30mm x 3mm mild steel angles.

Mild steel used as flanges or stiffeners shall be riveted to the ductwork, with 8 S.W.G rivets at 2” pitch. The joint faces of flanges shall be drilled for 10mm bolts at 75mm pitch.

Air tight access doors shall be provided on the ductwork wherever indicated on the drawings. The access doors, of sufficiently heavy construction to avoid distortion, complete with handles, shall be secured by brass wing nuts screwed into studs provided, on galvanized mild steel stiffening frames riveted, or bolted to the ductwork. The access doors shall be provided with felt or rubber gaskets to ensure that when closed they are perfectly tight.

The ductwork shall be installed with all joints air tight and adequately stiffened and braced shall have the largest radius possible with a minimum throat radius of one diameter if possible. Square or miter elbows will only be allowed where shown on the drawings. Turning vanes shall be fitted in square or miter elbows.

Transformer pieces except where situated on fan suction shall be constructed so that the angle on any side does not exceed 15° to the axis of the duct where possible.

Branch ducts shall enter main ducts expansion sections where possible. Where branch ducts occur, at taper or transformation pieces, the length of such pieces in the main duct shall be symmetrical about the axis of the branch.

## **6. BRACKETS AND SUPPORTS**

Supports and brackets for ductworks shall be made adjustable for height, spaced to ensure support and where practicable shall be fitted at each joint of the ductwork. Vertical ductwork shall be supported at each floor level, horizontal ducts at intervals not exceeding 2280mm and adjacent to fans, canvas joints and other equipment. All members of supports in contact with metal ductwork shall be galvanized after fabrication. Socketed joints shall have a minimum overlap of 50mm in the direction of flow. The joint shall be made with an approved type jointing compound with bolts or rivets at centres not exceeding 50mm. wherever access cannot be made for riveting or bolting self tapping screw of the shortest length which will give a satisfactory joint shall be used in lieu of the rivets or bolts, on size or diameters up to 530mm. All slip joints on circular ductwork are to have a spigot carefully swaged damper leaves shall be multi leaf type. The quadrants shall be of robust construction and securely fixed to the ductwork. The leaves shall be linked with a connecting rod and the ends of the spindle shall be housed in bearings. Dampers are to indicate the full and closed positions and are to be marked and then locked after air Volume has been set.

## **7.0 JOINTS**

### **7.1 Flexible Joints**

Flexible joints shall be provided on fan inlet and outlet connections and elsewhere on the ductwork where indicated. They shall be over the full cross-sectional area of the mating fan inlet or outlet section. The ends of the duct and fan connections shall be in line.

Flexible joints shall consist of, or be protected by, material having a fire penetrating time of at least fifteen minutes when tested in accordance with BS 476 Part 1 Section 3. The material shall be of the glass fibre cloth type, canvas or other approved material. The width of joints from metal edge to metal edge shall not be less than 80mm and more than 250mm.

All flexible joints other than fan inlet connections shall be between flanged ends. The flexible material flange shall be backed by an angle or flat iron flange and the flexible joint flat iron bar used with fan inlets shall not be less than 5mm thick.

## 7.2 Flexible Connections.

Where flexible connections are indicated or required between rigid ductwork and particular components or items of equipment, the internal diameter of the flexible duct shall be equal to the external diameter of the rigid ductwork and of the spigot type. The use of flexible duct between rigid sections of sheet metal ductwork to change direction or plane will not be permitted except where indicated or expressly authorized by the Engineer.

The flexible duct shall have a liner a cover of tough tea-resistant fabric equal in durability and flexibility to glass fibre shall be impregnated and coated with plastics. It shall be reinforced with a bonded galvanized spring steel wire helix or glass fibre cord or equal and shall be bonded to cover to ensure regular convolutions.

Alternatively the flexible duct shall consist of flexible corrugated metal tubing of stainless steel, aluminium, tinned steel or aluminium coated steel. The metal may be lined on the inside or the outside or both with plastics materials.

The joints to rigid spigots shall be sealed with a brush coat of pipe jointing paste or mastic compound. Ducts up to 150mm diameter shall be secured with a worm drive type hose clip complying with BS 3628. Ducts over 150mm diameter shall be secured with band clip.

The frictional resistance to air flow per unit length of the flexible duct shall not exceed 50% more than the frictional resistance per unit length of galvanized steel ducts of equivalent diameter. The radius ratio  $R/D$  for bends shall not be less than 2, where  $R$  is the centre line radius and  $D$  is the diameter of the flexible duct.

Flexible ducts shall be suitable for an operating temperature range of 18oC to 120oC and shall comply with BS 476 Part 1, Section 2, Clause 7 (Clause 1; surface of very low flame spread).

## **8.0 FINISH PAINTING**

Upon completion of the installation and after all tests have been carried out to the satisfaction of the Engineer, the plant, equipment, supports, etc. shall be examined and all priming coats damaged during erection made good.

Any plant or equipment, ductwork, etc., which is to be insulated, shall have had the priming paint protection made good before the application of the insulation. After the above procedures have been carried out to the satisfaction of the Project Manager, the various surface shall be given the necessary preparation as recommended by the paint and insulation manufacturers and finish painted in colours to be agreed between the Sub-Contractor and Project Manager, at a later date.

For the purposed of the Specification, however, it shall be deemed that the sub-contractor's tender price was based on the identification requirements for the various services detailed in Code of Practice DW/161 Identification of Ductwork as published by the H.V.A.

## **9.0 AIR INTAKES AND OUTLETS**

Unless otherwise indicated fixed louvers on external walls will be fitted at air intake and outlet positions. A galvanized steel wire mesh screen of 20mm diamond mesh and at 2mm diameter wire and complete with a frame of galvanized steel rod with securing lugs or of flat iron shall also be fitted on the inner side of the louvers.

## **10.0 FANS**

### **10.1 General**

Fans shall capable of giving the specified performance when tested in accordance with BS 848. Although estimated values of the resistance to airflow of items of equipment may be indicated, this does not relieve the Contractor to the responsibility for providing fans capable of delivering the required air volume flow through the system.

The make and design of fans shall be approved by the Engineer and evidence supporting noise levels and fan efficiencies shall be provided. Where fans are supplied with noise attenuations, full details of the attenuations shall be given.

Belt driven fans shall be fitted with pulleys suitable for V-belts; pulleys of the taper lock type may be used for drivers up to 30KW output. Alternatively, and in any case above 30KW output, pulleys shall be secured to the fan and the motor shafts by keys fitted into machined keyways. Pulleys shall be keyed to the fan shaft in the overhung position. Keys shall be easily accessible so that they can be withdrawn or tightened and they shall be accurately fitted so that the gib head does not protrude beyond the end of the shaft.

Machined bolts, nuts and washers only shall be used for the assembly of fans; all bearing surfaces for the heads of bolts or washers shall be count faced. Holding down bolts for fans and meters shall be square section under the head or be fitted with snugs to prevent them turning in the fan base plate when the nuts are tightened.

Any fan which is too large or too heavy for safe manhandling shall be provided with eyebolts or other lifting facilities to enable mechanical lifting equipment to be used.

## **10.2 Axial Flow Fans**

Axial flow fans shall be of either the single stage type or the multi-stage contra-rotating type with each impeller mounted on an independent motor. Casings shall be rigidly constructed of mild steel stiffened and braced to obviate drumming and vibration. Cast iron or fabricated steel feet shall be provided where necessary for bolting to the base or supports. Inlet and outlet ducts shall terminate in flanged rings for easy removal. The length of the fan (s) and motor(s) shall also terminate in flanges in order that the complete section may be removed without disturbing adjacent ductwork. Electrical connections to the motor(s) shall be through an external terminal box secured to the casing. Impellers shall be of steel or aluminium, the blades shall be secured to the hub or the blades and the hub shall be formed in one piece. The hub shall be keyed to a substantial mild steel shaft and the whole statically balanced. Blades shall be of aerofoil section. Shafts shall be carried in two bearings which may be ball roller or sleeve type. Lubricators shall be extended to the outside of the casing.

Where axial flow fans are driven by a motor external to the casing the requirements for pulleys and for V-belt drives and guards shall be met. Unless otherwise indicated a guard is not required for any part of a drive which is within the fan casing. An access door of adequate size shall be provided.

Where axial flow fans of the bifurcated type are indicated the motors shall be out of the air stream. Motors may be placed between the two halves of the casing in the external air or may be placed within the fan casing provided that effective ventilation is given to the motor. Where hot gases or vapours are being handled the motor and the bearings shall be suitable for operation at the temperature they may experience.

## **11.0 DAMPERS**

### **11.1 General**

Sufficient dampers shall be provided to regulate and balance the system. Dampers on grills or diffusers shall be used for fine or secondary control. All dampers shall be sufficiently rigid to prevent fluttering. Unless otherwise indicated, the air leakage past dampers in the fully-closed position shall not exceed 5% of maximum design air flow in the duct. All duct dampers except fire dampers and self-closing flaps shall be fitted with locking devices and position indicators. Dampers shall be generally in accordance with the appropriate HVCA Specification.

Each Primary control damper shall be fitted with a non-corrodible label stating the actual air flow in M<sup>3</sup>/S and the cross-sectional area. Alternatively, these figures shall be painted in a visible position on the adjoining ductwork or insulation. The position of a damper as set after final regulation and balancing be indelibly marked on the damper quadrant

### **11.2 Butterfly dampers**

Butterfly dampers shall each consist of two plates edge seamed, and of the same thickness of material as that from which the associated duct is made, and rigidly fixed to each side of a mild steel operating spindle, the ends of which shall be turned and housed in non-ferrous bearings.

### **11.3 Bifurcating dampers**

Bifurcating dampers shall be of 2mm thick sheet for sizes up to 450mm square. For larger sizes, the thickness shall be as indicated. Damper plates shall be rigidly fixed to square section mild steel spindles the ends of which shall be turned and housed in non-ferrous bearings.

### **11.4 Multi-leaf dampers**

Multi – leaf dampers shall consist of two plates of material of the same thickness as the associated duct and rigidly fixed to each side of an operating spindle, the ends of which shall be housed in brass, nylon, oil impregnated sintered metal, PTFE impregnated or ball bearings. The ends of the spindles shall be linked such that one movement of the operating handle shall move each leaf an equal amount. An inspection door shall be provided adjacent to each multi-leaf damper.

On low velocity systems only, multi-leaf damper blades may be of a single plate, at least 1.6mm thick and suitably stiffened, and the blade linkages may be within the duct. Those dampers shall have bearings and inspection doors as specified above.

### **11.5 Damper Quadrants and Operating Handles**

Quadrants and Operating handles shall be of die-cast aluminium with the words "OPEN" and "SHUT" cast on the Quadrants. Quadrants shall be securely fixed to the damper spindles and shall be close-fitting in the quadrants hubs to prevent any damper movement when the damper levers are locked.

### **11.6 Self-closing dampers**

Self-closing dampers shall be designed so as to present the minimum of resistance to airflow under running conditions, to take up a firm, non-fluctuating position under running conditions and to give a tight shut-off when closed. They shall incorporate rubber stops to prevent rattling and to give a tight shut-off when closed. They shall incorporate rubber stops to prevent rattling.

### **11.7 Sliding Dampers**

Sliding dampers shall be provided only where indicated. They shall be of 2mm. thick sheet steel for size up to 450mm square. For larger sizes the thickness shall be as indicated. They shall run in guides lined with felt.

### **11.8 Iris type dampers.**

Iris type dampers may be used in ducting up to 600mm, dia. Or 450mm square. The control shall be on the outside of the damper. The design shall be such that the leaves of the damper can be easily moved for adjustment.

## **12.0 GRILLES**

### **12.1 Supply & Return Registers**

Supply registers shall be manufactured from high grade, extruded Aluminium sections with lacquered finish and fixing shall be 32mm with bevelled edges.

The registers shall have a front set of blades parallel to the long dimension, of rear set of blades parallel to the short dimension, the blades being at 17mm centres and individually adjustable with opposed blade dampers.

### **12.2 Extract grilles**

Extract grilles shall be similar to the Supply Registers described above with the exception that they have only one set of blades parallel to the long dimension.

### **12.3 Fresh Air Grilles**

These shall be manufactured from sheet steel with steel fixing flanges and shall be galvanized after manufacture. An insect screen shall be fixed downstream.

### **12.4 Diffusers**

These shall be manufactured from high grade extruded sections with lacquered finish, bevelled flanges and removable core. Fixing shall be by self-tapping screws through the duct into neck of the diffuser.

### **12.5 Louvres**

Discharge and Fresh air Intake louvres shall be manufactured from mild steel and be galvanized after manufacture. A screen shall be fixed to the back of the louvres

## **13.0 ATTENUATORS**

### **13.1 General**

Purpose made attenuators and sound absorbing material shall be designed to air flow, have adequate strength and cohesion to resist erosion by air flow and do not produce dust. They shall be free of odour and proof against rot, damp and vermin and shall comply with the requirements as to fire and smoke hazards. Adhesives shall be compatible with the sound absorbent material and should preferably be non-flammable.

Where sound absorbent material and /or special attenuators are indicated they shall either reduce the sound level in the space, due to the equipment, to the specified value or shall give the specified sound level attenuation over the specified range of frequencies. Purpose made attenuators shall be tested in accordance with HVRA Laboratory Report No. 55 (Code for the measurement of the performance of unit silencers). The insertion loss and generated noise level for each octave band and the pressure loss of the silencer shall be stated.

Attenuators shall be suitable for internal air pressure of 100N/m<sup>2</sup>, air stream temperatures of up to 400c and free from air stream erosion for velocities up to 25m/s. The mineral wool lining shall be rot, vermin and fire-proof. Attenuator casing shall be pre-galvanized sheet steel with galvanized pre-drilled flanges.

### **13.2 Rectangular Attenuators**

These shall be rectangular in section with splitters forming air passages in parallel. The mineral wool lining shall be resin bonded.

### **13.3 Circular Attenuators**

Circular section attenuators will have a central pod. The mineral wool lining shall be retained by expanded steel. The end flanges shall be match drilled to suit the fan which they are fixed to.

### **13.4 Acoustic lining**

Where indicated on the contract drawings, the ductwork shall be acoustically lined. The lining shall consist of resin bonded mineral wool 25mm, thick fixed to the ductwork by a suitable adhesive.

## **14.0 INSTRUMENTS**

### **14.1 General**

The instruments, gauges etc, detailed in this section shall be provided in addition to those associated with specific items of plate and detailed elsewhere, they shall be mounted in accessible positions and shall be easily read.

### **14.2 System Static Pressure Gauge**

A system static pressure gauge shall be provided for the system. It shall consist of a small inclined manometer gauge similar to a filter gauge. The edge of the gauge shall be connected to the system and the other end shall be left open to the plant room but where fluctuation of the static pressure in the plant room may occur the gauge shall be connected across the main fan. Such fluctuations may be caused by wind pressure affecting large open air intakes to the plant room.

## **15.0 VIBRATION, NOISE AND SOUND INSULATION**

### **15.1 Anti-Vibration Mountings**

Fans, compressors, motors and any other vibration-inducing equipment shall be isolated from the building structure by anti-vibration mountings which shall be compressed machinery cork, spring or rubber dampers or rubber/metal bearers as indicated.

### **15.2 Noise**

The noise produced by the installation in the spaces served, in any adjacent buildings and in the open air surrounding plant rooms shall be kept as low as possible. This shall be specially considered in the selection of fan motors, grilles and the internal finish and arrangements of extraction ducting.

Noise level information for fans based on octave analysis data, shall be stated. The reference level and the testing technique shall be stated.

The sound level in the spaces served, due to the equipment shall comply with the recommended design criteria given in the IHVE Guide (Table 13.1 of 1965 Edition). The maximum sound pressure level due to ventilation system must not exceed value mentioned below measured by a reference value of  $2 \times 10^{-5} \text{ N/m}^2$  transferred to a logarithmic scale, and measured at any point 1.5 meters above the floor and 1.0 meters from the walls.

The maximum sound pressure level measured at any point 4 metres from the extract point must not exceed 55dB.

The maximum sound pressure level measured at any point 4 metres from fans must not exceed 60dB.

## **16.0 THERMAL INSULATION**

### **16.1 General Description**

All heated, cooled, and recirculated air ductwork shall be insulated.

Insulation shall be of 25mm thick expanded polystyrene sheet, or spray applied polyurethane foam to a uniform thickness of 25mm. Polystyrene shall be fixed so that the edges butt closely without gap and the insulation shall overlap at corners by the thickness of the insulation. The sheet shall be fixed by means of a suitable adhesive and plastic impingement pins attached to the ductwork.

### **16.2 Ductwork In Plant Room**

The insulation described above in Clause 5.1 above shall be finished by the application of a 15mm thick layer of hard setting finish. Insulation shall bevelled thick to angle of 45o at all connecting flanges, access hatches and all other places where operation or maintenance is likely to cause the breaking of the insulation.

The insulation shall then be given a vapour sealing by the application of two coats of anti-condensation paint.

### **16.3 Ductwork External to plant Rooms**

The insulation described in Clause 5.1 above shall finish by the application of two coats of bitumastic.

## **17.0 ELECTRICAL EQUIPMENT AND WIRING**

### **17.1 Scopes**

The responsibility for electrical equipment and wiring shall be as defined as below:-

An on-off starter shall be provided and placed in the appropriate position for connection of the fans required for the installation and within a time agreed with the Engineer fully detailed wiring diagrams for all connections to them shall be availed.

The Installer shall be responsible for the accuracy of all wiring diagrams provided by him and for the correct internal wiring of all pre-wired equipment supplied. The Installer shall reimburse the full cost of abortive or remedial work arising from any error in these aspects.

### **17.2 General**

Unless otherwise indicated all electrical equipment and installation shall be suitable for use in ambient temperatures up to 40°C and relative humidities up to 90%. For tropical climates, electrical equipment shall be suitable for use in the temperature and humidity as indicated; it shall be proof against atmospheric corrosion, including that of saline air where relevant, and materials shall not be susceptible to mould growth or attack by termite and similar hazards.

### **17.3 Electrical Motors**

Electrical motors shall comply with BS 170 2048 or with BS 2613 and BS 3979 as appropriate. All motors shall have Class E insulation (BS2757) and can be continuously rated.

They shall be screen protected (BS2817) unless otherwise indicated. Under all normal conditions without being overloaded. All motors larger than 0.75kw output shall be three phase, for motors above 15kw output the type of motor and method of starting shall be such as to limit the starting and run-up currents to three times the rated full load current unless otherwise indicated. No motor shall run faster than 25 rev/s unless otherwise indicated.

## **18.0 INSPECTION, COMMISSION AND TESTING**

### **18.1 General**

Unless otherwise indicated tests shall be carried out in accordance with the appropriate BS or CP. Test certificates for works tests, site tests and tests required by BS shall be submitted in duplicate to the Engineer.

### **18.2 Testing**

Where an individual inspection or tests take place at outside the site of the works representatives of the Engineer will be required to be present.

Unless otherwise indicated the contract shall include the cost of all tests, necessary instruments, plant supervision and labour both at work and on site. The accuracy of the instruments shall be demonstrated where so directed by the Engineer.

The site test shall be of at least six hours duration. Any defects or workmanship, materials and performance maladjustments or other irregularities which become apparent during the tests shall be rectified by the supplier at his expense and the tests shall be repeated at his expense to the satisfaction of the Engineer.

The Supplier/Installer's representative present at the site tests shall be fully conversant with the operation of the thermostatic controls and shall be expected to explain the operation and safety controls forming part of the installation to the employer's representatives.

#### **18.2.1 Site Tests**

The Installer shall supply all instruments and equipment necessary to carry out site tests and shall arrange with other parties for the testing of associated equipment which may affect the performance of the plants installed under these works.

#### **18.2.2 Site Tests-Fans**

All fans shall be charged with suitable lubricant and shall be tested upon completion of the auxiliary system erection to ascertain that the performance of each fan complies with the requirements of the specification.

### **18.2.3 Completion of Works – Balancing and Commissioning**

Following the site tests and prior to handover, Mechanical Ventilation or Air-Conditioning systems shall be balanced by means of grills, dampers and other special controls installed so to give the required air flow rates and where applicable the required temperatures, pressures and humidity conditions in all areas served by the said systems.

The complete system shall be balanced and commissioned as a whole. Sectional balancing and commissioning on any part of the system where this excludes final complete system balancing and commissioning shall not be accepted.

Test volumes within ducts shall be within +5% of the design volumes, and volumes at grills and diffusers shall be within +10% of the design volumes.

When the system has been balanced to the satisfaction of the project manager, it shall be run under complete automatic control for 72 hours continuous operation to ascertain any faults in operation before acceptance and handover. Any faults discovered during this time shall be corrected and another test or tests of 72 hours duration shall be carried out to ensure satisfactory operation, all at the expense of the Supplier/Installer.

During this phase, particular attention shall be paid to:

- The maintenance of cleanliness of all plant and extraction systems during construction and ensuring that extraction systems are cleaned through as part of commissioning.
- The protection of plant, particularly sensitive or fragile items, from the activities of other trades during construction and from dirt and mal operation during commissioning.
- The protection of electrical of electrical equipment from damp during construction and commissioning.

## **19.0 CONTROL SYSTEM**

Particular attention shall be paid to the following features:

- Satisfactory operation of any automatic or manually operated sequence to be used in the event of fire.
- Safety in the event of failure and of sudden resumption of electricity supply.
- Satisfactory operation of safety interlocks designed for the protection of personnel, such as those associated with the high voltage electrically operated plant.

The following items shall be checked and/or tested and recorded on the site Test Certificate:-

- Set devised value of all control devices
- Satisfactory operation of equipment protection devices.
- Satisfactory operation of all sequencing operations and alternate working selections and automatic or manual change-over of duplicate plant.

## **20.0 NOISE AND SOUND CONTROL**

Sound level reading shall be taken with a simple sound level meter using the 'A' scale weighting network. The spaces in which readings shall be taken shall be as agreed with the Engineer but will in general be the following:-

- Plant rooms
- Occupied rooms adjacent to plant rooms
- Outside plant rooms facing air intakes and exhaust to assess possible nuisance to adjacent accommodation. If the adjacent accommodation is private residential building
- tests may be required at night.
- In the space served by the first grille or diffuser after a fan outlet.
- In any space where, by the addition of special silencing material or techniques of by classification of use, a low level of noise is clearly required.

Alternatively, sound level reading shall be taken using a sound analyzer to give an octave band analysis of the ground spectrum and to pinpoint the frequency values of peak sound levels. The spaces in which readings shall be taken shall be as agreed with the Engineer but will in general be as detailed in paragraph above.

## **21.0 OPERATING AND MAINTAINANCE INSTRUCTION**

The Supplier/Installer shall demonstrate and explain the plant and the method of starting, running and stopping to such staff as the Engineer shall nominate.

He shall provide three sets of operating and maintenance instructions which shall be enclosed in durable covers. The operating and maintenance instructions shall include;-

- A brief outline of the operation of the plant.
- Instructions on how to start and stop the plant, noting any safety and / or sequencing arrangements.
- Details of required maintenance with suggested frequency of action
- Details of all lubricating oils and greases required and filter replacement
- Details of each item of plant including the name and address of the manufacturer, type and model, serial number, duty and rating.

The operating and maintenance instructions shall be handed to the Engineer not later than at the end of the commissioning period.

## **22.0 SPARE PARTS**

The Installer shall submit a priced list of any extra materials which he recommends should be purchased for the Ventilating and Air Conditioning Plants and all associated equipment and control gear and extras not supplied as standard. He shall be required to give a guarantee that he will hold sufficient running stock of spare parts for the maintenance of the equipment.

**BQ FOR PROPOSED RENOVATIONS AT COFFEE PLAZA (HEADQUARTERS COFFEE DIRECTORATE)**

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
	<p align="center"><b>Refurbishment of the existing washrooms</b></p> <p><b>SANITARY APPLIANCES</b></p> <p>Supply, deliver, install, test and commission the following sanitary appliances complete with all the accessories including all connections to the services, waste, jointing to water supply overflows, supports and all plugging and screwing to walls and floors.</p> <p>(i) All sanitary fittings shall be in approved colour.                      (ii) The Model and Ref No. indicated is only a guide to the type and quality of fittings.                      (iii) Equivalent and Approved models may be acceptable.</p> <p><b>Water Closet (WC) Suite</b></p> <p><b>Water closet suite pan</b>                      Water closet suite pan, in white colour, comprising of W.C. bowl, 'P' or 'S' trap connector, heavy duty matching plastic seat and cover with metal top fixed (chrome plated) hinges.</p> <p><b>WC Flush valves</b>                      40mm dia.exposed/concealed water closet low pressure flush valve, chrome plated, back entry, with integral vacuum breaker, non-hold-open features and non-return valve, inlet control stop and wall plate comprising flush valve.</p> <p><b>Wash hand basin (WHB)-Counter Top</b>                      Countertop wash hand basin size 560 x 440mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, chrome plated non-concussive time delay press action pillar tap as Cobra model and chrome plated bottle trap (32mm 'P' trap) with 75mm seal. To be of IDEAL STANDARD Model-Plan Above Counter 109.003.38 countertops washhand basin or equal and approved.</p> <p><b>Pedestal wash hand basin</b>                      Wash hand basin size 510 x 420mm with one tap holes and chain stay hole, 32mm diameter chrome plated pop up chain waste, concealed wall brackets, chrome plated single tap hole basin mixer as Cobra and chrome plated bottle trap (32mm 'P' trap) with 75mm seal. The wash hand basin to be as Twyford's 'Sola 510' or equal and approved.</p>				
A		No.	14		
B		No	14		
C		No	1		
D		No	13		
	Sub total for sanitary fittings carried forward to next page				

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
Sub total for sanitary fittings brought forward from previous page					
A	<p><b>Robe Hook</b> Chrome plated robe hook mounted by concealed screws to doors. To be as IDEAL STANDARD or equal and approved.</p>	No.	14		
B	<p><b>Toilet Roll Holder</b> A chrome plated wall hung toilet roll holder</p>	No.	14		
C	<p><b>Mirror</b> 6mm thick polished plate glass silver backed mirror with bevelled edges, size 600 x 700mm, Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.</p>	No.	14		
D	<p><b>Urinal bowls</b> One range urinal bowl in white vitreous china comprising 1No. bowl with 1No. division complete with bowl/divisions support complete with 4.5 litres automatic ceramic cistern and fittings including siphon ball valve, cistern supports and drip tap in brass, chrome plated bottle trap, chrome plated flush pipe and spreader ref SS 6071SS with all connections, wall hangers/supports. To be as Twyfords 'Camden' or approved equivalent.</p>	No.	6		
E	<p><b>Urinal Bowl Flush Valves</b> 32mm urinal bowl flush valve for the above urinal bowls complete with, back entry with integral vacuum breaker, non-hold-open features and non-return valve, inlet control stop and wall plate comprising flush valve, bent chrome plated flush pipe and rubber pipe connector. The flush valve to be push button type. The fittings shall be as 'Docol' or equal and approved.</p>	No	6		
Sub total for sanitary fittings carried forward to next page					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
<b>Sub total for sanitary fittings brought forward from previous page</b>					
A	<p><b>Water Closet (WC) Suite</b>                      Close-coupled WC suite ('S' or 'P'-trap) in approved colour complete with horizontal outlet to BS 3402 with 7.5 litre valveless low level ceramic cistern and fittings including siphon, 15mm diameter side inlet ball valve, 20mm diameter side overflow, plastic flush bend, dual flush system, inlet connection, chrome-plated lever and heavy plastic seat and cover with metal top fixed (chrome plated) hinges. All to be as IDEAL STANDARD "PLAN"-wc pan model 109.003.34 water closet or equal and approved.</p>	No.	2		
B	<p><b>Kitchen Sink (SBSD)</b>                      Single bowl, single drainer single bowl stainless steel kitchen sink of size 1000 x 500mm as manufactured by ASL 140 or equal and approved. The bowl size to be 420 x 355 x 150mm deep complete with chrome plated 40mm waste fittings, plugs, chain stays, overflow, 1No. 15mm diameter chrome plated sink bib tap as Cobra, chrome plated bottle trap with 75mm deep seal and chain waste fitting.</p>	No	6		
C	<p><b>Undersink heater</b>                      10 litres capacity undersink instantaneous water heater complete with 3.0kw electric heating element, externally adjustable capillary type thermostat, polyurethane form thermal insulation, corrosion-proof moulding outer casing, mountings, water and electrical connections. The heater shall be as Ariston with power supply 3.0kw, 240/50Hz or equal and approved.</p>	No	6		
<b>Replacement of faulty sanitary fittings parts</b>					
D	9ltrs Cistern	No	10		
E	9ltrs Cistern Cover	No	10		
F	Toilet seat covers as twyford	No	10		
<b>Total for sanitary fittings carried forward to summary page F - 14</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
	<b>INTERNAL PLUMBING WORKS</b>				
	<b>PPR PN20 PIPEWORK</b>				
	Supply, deliver and install pipes, tubing and fittings as described and shown on the drawings. The pipes shall be PN 25 PPR pipes where exposed to adverse weather condition and all conforming to the current European standards for PPR installations and to the Engineers approval, pipe jointing shall be by polyfusion or use of electric coupling. 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.				
A	20mm diameter pipework	Lm	30		
B	25mm diameter pipework	Lm	60		
C	32mm diameter pipework	Lm	96		
D	40mm diameter pipework	Lm	60		
E	50mm diameter pipework	Lm	84		
F	65mm diameter pipework	Lm	90		
	<b>Bends</b>				
G	20mm diameter bend	No.	9		
H	25mm diameter bend	No.	8		
I	32mm diameter bend	No.	11		
J	40mm diameter bend	No.	5		
K	50mm diameter bend	No.	8		
L	65mm diameter bend	No.	7		
	<b>Tees</b>				
M	25mm equal tee	No.	5		
N	32mm equal tee	No.	6		
<b>Sub total for internal plumbing works carried forward to Next page</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
<b>Sub total for internal plumbing works carried forward to Next page</b>					
<b>Tees</b>					
A	40mm equal tee	No.	5		
B	50mm equal tee	No.	6		
C	65mm equal tee	No.	7		
<b>Reducers</b>					
D	32 x 25mm diameter reducer	No.	8		
E	40 x 32mm diameter reducer	No.	6		
F	50 x 32mm diameter reducer	No.	9		
G	50 x 40mm diameter reducer	No.	5		
H	65 x 50mm diameter reducer	No.	8		
<b>Flexible Tubing</b>					
I	15mm diameter x 300mm long flexible connectors complete with integral chrome plated angle valve as Cobra or equal and approved.	No.	16		
J	Hacking of the floors,walls, columns for pipework installation and making good of the surfaces.	Sm	30		
K	Allow for a sum of Kenya shillings Two Hundred Fifty Thousand for project management expenses to cater for stationary, transport, sample approvals and other administration costs,	Item	1		
<b>ELECTRICAL WORKS</b>					
L	Allow for electrical works wiring and fitting to all pumps, control panel and float switches from isolator provided by others with 3 metres distance.	Item	1		
<b>Male/Female Adapters (Brass threaded)</b>					
M	20mm brass threaded adapter	No.	5		
N	25mm brass threaded adapter	No.	4		
<b>Sub total for intenal plumbing works carried forward to next page</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
<b>Sub total for intenal plumbing works brought forward from previous page</b>					
<b>Male/Female Adapters (Brass threaded)</b>					
A	32mm brass threaded adapter	No.	6		
B	40mm brass threaded adapter	No.	2		
<b>Valves</b>					
C	25mm gate valve	No.	3		
D	32mm gate valve	No.	5		
E	40mm gate valve	No.	5		
F	50mm gate valve	No.	12		
G	65mm gate valve	No.	10		
<b>Unions</b>					
H	25mm diameter pipe unions	No.	6		
I	32mm diameter pipe -ditto-	No.	10		
J	40mm diameter pipe -ditto-	No.	10		
K	50mm diameter pipe -ditto-	No.	18		
L	65mm diameter pipe -ditto-	No.	15		
M	Allow for water meter connection to the plumbing system	Item	1		
<b>Removal and handover of faulty sanitary fittings to the client for safe custody</b>					
N	Water closet	No	20		
O	Wash hand basin	No	20		
P	Urinal bowls	No	15		
Q	Water closet cistern	No	15		
<b>Total for plumbing works carried forward to summary page F - 14</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
	<b>FOUL WATER INTERNAL DRAINAGE</b> Supply ,deliver and install the following UPVC, MUPVC, soil and waste systems respectively to B.S 5255 with fittings fixed to Manufactures Printed instructions and manufactured by reputable manufacturers. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system.				
	<b>MuPVC and uPVC Waste and Soil pipework</b>				
A	150mm diameter heavy gauge golden brown UPVC pipe	Lm	24		
B	100mm diameter heavy gauge golden brown UPVC pipe	Lm	48		
C	100mm diameter heavy gauge grey mUPVC pipe	Lm	56		
D	50mm diameter waste pipe	Lm	48		
E	40mm diameter waste pipe	Lm	12		
	<b>Bends</b>				
F	100mm diameter long radius bend	No.	2		
G	150mm diameter sweep bend	No.	5		
H	100mm diameter short radius bend	No.	4		
I	50mm diameter sweep bend	No.	2		
J	40mm diameter sweep bend	No.	2		
	<b>Tees</b>				
K	150mm diameter sweep tee	No.	4		
L	100mm diameter sweep tee	No.	4		
M	50mm diameter sweep tee	No.	5		
N	40mm diameter sweep tee	No.	4		
<b>Subtotal for internal drainage works carried forward to next page</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
<b>Subtotal for internal drainage works brought forward from previous page</b>					
<b>Access Caps</b>					
A	150mm diameter access cap	No.	1		
B	100mm diameter access cap	No.	1		
C	50mm diameter acces cap	No.	1		
D	40mm diameter access cap	No.	1		
<b>Boss Connectors</b>					
E	100 x 50mm diameter boss connector	No.	2		
F	150 x 100mm diameter boss connector	No.	2		
<b>Single Branches</b>					
G	100mm diameter single branch	No.	2		
<b>WC Connectors</b>					
H	100mm diameter WC connector	No.	16		
<b>Traps</b>					
I	100 x 50mm diameter floor trap and grating	No.	15		
<b>Excavations for drainage pipework</b>					
J	Excavate trench in rock 300mm wide and depth not exceeding 1000mm deep and average 750mm deep. Bed shall be approved by Engineer before laying of pipes. Fill with murrum and compact in layers of 75mm. Cart away surplus soil.	Lm	5		
<b>Manholes and Inspection Chambers</b>					
K	Construct inspection chamber size 600 x 450mm and averaging 750mm deep constructed in 100mm thick concrete base (1:3:6), approved 150mm block sides rendered all around in cement and sand (1:4). It shall have an approved heavy duty cast iron cover and frame as manufactured by E.A Foundry works. Include all necessary excavations, disposal and form work. To be as manhole type 'A'.	No.	1		
<b>As-built Drawings Maintenance and Operation Manuals</b>					
L	Allow for as-built drawing, maintenance and operation manuals in both soft and hard copies. Three copies of the as-built drawing shall be submitted in A1 paper in a scale of 1:50.	No	1		
<b>Subtotal for internal drainage works carried forward to next page</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Cost (Kshs)
<b>Subtotal for internal drainage works brought forward from previous page</b>					
<b>Storm water drainage</b>					
A	<b>Submersible Pump</b> A submersible pumpset capable of delivering 5.5m <sup>3</sup> /hr against 15M head, power rating 0.7KW, single phase, 50HZ 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.	Set	1		
B	Chasing of the tiled works	SM	10		
C	Replace the tiles matching the existing	SM	10		
<b>Testing and Commissioning</b>					
D	Allow for setting to work, testing and commissioning of the plumbing and drainage works to the satisfaction of the Engineer.	Item	1		
<b>Total for internal drainage works carried forward to summary page F - 14</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
<b>TOILET MECHANICAL VENTILATION WORKS</b>					
A	<p><b>Extract fan</b></p> <p>Extract fans each capable of volume flow rate 2.1m<sup>3</sup>/sec against a pressure drop of 250Pa at near maximum efficiency. Fan to be as roof mounted axial flow fan with horizontal air discharge configuration, complete with supports, flexible connections and anti-vibration mountings. Maximum sound level of 50dB, with motor rating approximately 1.2kW. The fan to be 3-phase.</p>	No.	2		
B	<p><b>Fan Control Panel</b></p> <p>A splash proof fan control panel complete with operational switches shall be installed in a room remote from the fan. It shall incorporate isolator, contactors, phase failure relay, overheat safety controls and fuses and pilot lamps to enable operating conditions to be checked. The panel shall be cut of mild steel and anodized after manufacture. It shall include volt free contacts for on-off and audible signal connection to a central indicator panel and to BMS.</p>	No.	2		
C	<p><b>Ductwork</b></p> <p>Galvanized mild steel ductwork 1.2mm thick complete with bends, hangers, supports, sleeves, flexible connectors, branch duct take-offs, flanges, access doors, test reducers, splitters, turning vanes and accessories. All painted both externally and internally with suitable walt black paint.</p>	SM	30		
D	<p><b>Transformation Pieces</b></p> <p>Allow for various sizes of transformation pieces in Galvanised mild steel thickness 1.0mm as indicated on the contract drawings and necessary for complete ductwork installation.</p>	Item	1		
E	<p><b>Extract air grilles</b></p> <p>Egg crate extract grilles with damper fitted size 1000mm x 300mm capable of extracting m<sup>3</sup>/sec of air.</p>	No.	36		
<b>Total for mechanical ventilation works carried forward to summary page F - 14</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs.)	Amount (Kshs.)
<b>LABORATORY WORKS</b>					
A	<p><b>Kitchen Sink</b> Double bowl, double drainer stainless steel kitchen sink of size 1800 x 600mm as manufactured by ASL. The bowl size to be 430 x 420 x 200mm deep complete with chrome plated 40mm waste fittings, plugs, chain stays, overflow, 1No. 15mm diameter chrome plated sink mixer with over-arm swivel spout as <b>Cobra model 166/04</b> with carina handles, chrome plated bottle trap with 75mm deep seal and chain waste fitting.</p>	No	2		
B	<p><b>Undersink heater</b> 10 litres capacity undersink instantaneous water heater complete with 3.0kw electric heating element, externally adjustable capillary type thermostat, polyurethane form thermal insulation, corrosion-proof moulding outer casing, mountings, water and electrical connections. The heater shall be as Ariston with power supply 3.0kw, 240/50Hz or equal and approved.</p>	No.	2		
C	<p><b>Water storage tank</b> Supply, deliver and install vertical close end plastic moulded tank of capacity 1,000 litres and diameter 1120mm x 1280mm high. The tank to be assembled complete with cover and having screwed connections for inlet, outlet, overflow, 25mm medium pressure ball valve, drain pipes and any other necessary item for its proper functioning. The tank shall be mounted on a flat roof slab and shall be as ROTO Model or approved equivalent.</p>	No.	1		
D	<p><b>Kitchen hood for Coffee Roasters</b> Provide for proper anchorage and connection of the kitchen hood to the mechanical duct. <i>The extract hood size shall be 3000mm wide by 4500mm long by 600mm deep and shall be constructed out of 16 S.W.G. anodized aluminium sheets and stiffened by a frame of 38 x 38mm galvanized mild steel R.H.S. The hood shall have a 75mm wide by 25mm deep grease drainage channel all round. The hood shall measure 3000mm wide x 4500mm long and taper to approximately 700mm wide and 4500mm long at the top.</i></p>	No.	1		
<p><b>Total for mechanical ventilation works carried forward to summary page F - 14</b></p>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs.)	Amount (Kshs.)
<b>Subtotal for internal drainage works brought forward from previous page</b>					
	<b>Grease filter</b>				
A	Supply and install the filter to be composed of folded woven metal material interspersed with layers of expanded metal mesh of stainless steel and shall be capable of filtering a total of 11088m <sup>3</sup> /hr. The filter panels shall be easily removable for washing as and when necessary.	No.	6		
	<b>Kitchen Extract fan</b>				
B	Extract fans each capable of volume flow rate 0.4m <sup>3</sup> /sec against a pressure drop of 250Pa at near maximum efficiency. Fan to be as Aerofoil axial flow fan, complete with supports, flexible connections and anti-vibration mountings. Maximum sound level of 50dB, with motor rating approximately 0.4kW.	No.	1		
	<b>Fan Control Panel</b>				
C	A splash proof fan control panel complete with operational switches shall be installed in a room remote from the fan. It shall incorporate isolator, contactors, phase failure relay, overheat safety controls and fuses and pilot lamps to enable operating conditions to be checked. The panel shall be cut of mild steel and anodized after manufacture. It shall include volt free contacts for on-off and audible signal connection to a central indicator panel and to BMS.	No.	1		
	<b>Ductwork</b>				
D	Galvanized mild steel ductwork 1.2mm thick complete with bends, hangers, supports, sleeves, flexible connectors, branch duct take-offs, flanges, access doors, test reducers, splitters, turning vanes and accessories. All painted both externally and internally with suitable walt black paint.	SM	30		
	<b>Transformation Pieces</b>				
E	Allow for various sizes of transformation pieces in Galvanised mild steel thickness 1.0mm as indicated on the contract drawings and necessary for complete ductwork installation.	Item	1		
<b>Subtotal for mechanical ventilation works carried forward to next page</b>					

Mechanical works Bq for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)

Item	Description	Unit	Qty	Rate (Kshs.)	Amount (Kshs.)
	<b>Subtotal for mechanical ventilation works brought forward from previous page</b>				
	<b>Working Drawings</b>				
A	<p>Prepare and submit three sets of working plan and isometric layout drawings to easily readable scale, A1 or A0 paper size format as follows;</p> <p>i) general arrangement drawings of all equipment, plant etc.                      ii) routes - types and sizes and arrangement of all pipework                      iii) wiring (electrical &amp; control) details                      iv) any other details as per specifications</p> <p>Drawings are to be submitted in soft copy (AutoCAD format) &amp; hard copy to the client, the Architect and the Engineer. The soft copies to be stored in CD and 4GB flash disk. Allow for preparation &amp; submitting draft and three final copies of operation, instruction and maintenance manuals to Engineer's approval.</p>	No	1		
B	Allow for 32mm water gms pipe work water supply connection	Lm	50		
C	32mm diameter gate valve	No.	1		
<b>Total Cost for Coffee Laboratory Installation Carried to Summary Page F - 14</b>					

**SUMMARY PAGE FOR PROPOSED RENOVATIONS WORKS AT COFFEE PLAZA  
(HEADQUARTERS COFFEE DIRECTORATE)**

1	Total for sanitary fittings brought forward from page F -3	
2	Total for internal plumbing works brought forward from page F - 6	
3	Total for internal drainage works brought forward from page F - 9	
4	Total cost for toilet mechanical ventilation system brought forward from page F -10	
5	Total cost for Laboratory installation works brought forward from page F - 13	
6	Allow for contingency to be used at the discretion of the engineer in concurrence with the client	500,000.00
Total mechanical works costs for Proposed Renovations at Coffee Plaza (Headquarters Coffee Directorate)		

**ELECTRICAL WORKS**

**ELECTRICAL INSTALLATION WORKS FOR THE PROPOSED  
RENOVATIONS AT COFFE PLAZA (HEADQUARTERS COFFEE  
DIRECTORATE)**

**WP ITEM NO. D116 NB/NB/2102 JOB NO 10382C**

**TENDER SPECIFICATIONS AND BILLS OF QUANTITIES FOR  
ELECTRICAL ENGINEERING SERVICES  
INSTALLATION WORKS**

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SECTION A

INSTRUCTIONS TO TENDERERS

INSTRUCTIONS TO TENDERERS

1. CONTENTS

DESCRIPTION

Contents .....Elect/A-1

Tender Evaluation Criteria .....Elect/A-2 – Elect/A-5

Note.

This criterion shall be used to evaluate the bidders proposed to carry out the specialized works who shall be domestic subcontractors to the main bidder on award of the contract.

**TENDER EVALUATION CRITERIA**

After tender opening, the tenders will be evaluated in 2 stages, namely:

1. Preliminary Evaluation;
2. Technical Evaluation;

Note: This criterion shall be used to evaluate sub contracts

**STAGE 1: PRELIMINARY EVALUATION**

This stage of evaluation shall involve examination of the mandatory requirements as set out in the Tender Advertisement Notice or Letter of Invitation to Tender and any other conditions stated in the bid document.

These conditions shall include the following:

- i) Company Certificate of incorporation/registration;
- ii) Current certificate of Registration with National Construction Authority (NCA 5 and above) in Electrical Installation Works
- iii) Current Annual NCA contractor's Practicing License;
- iv) Current Class of Licenses with the Energy and Petroleum Regulatory Authority (EPRA) Class B and above.
- v) Valid Single Business Permit
- vi) The bid has been submitted in the format required by the procuring entity with all the sections as issued by the procuring entity.
- vii) Valid Tax Compliance Certificate;
- viii) Duly filled Confidential Business Questionnaire;
- ix) Duly signed Statement of Compliance;
- x) Compliance with technical Specifications
- xi) Manufacturer Authorization letter for UPSs, Data Switches and CCTV cameras

Note:

- a) The bid security shall be in accordance with clauses 13 and 23.2 of Instruction to Tenderers which states as follows:
  - Clause 13.1 of Instruction to Tenderers, "the tenderers shall furnish as part of his tenders a Bid surety in the amount stated in the tender document in the Appendix to Instructions to Tenderers".
  - Clause 13.2 of Instruction to Tenderers, "the unconditional Tender surety shall be in Kenya shillings and be in form of a certified cheque, bank draft, an irrevocable letter of credit or a guarantee from a reputable Bank/ Insurance approved by PPRA located in the Republic of Kenya. The format of the surety shall be in accordance with the sample form included in the tender documents and the tender surety shall be valid for 150 days from the date of tender opening".
  - Clause 23.2 of Instruction to Tenderers: "For the purposes of this clause, a substantially responsive tender is one which conforms to all terms and condition and specifications of the tender document without material deviation or reservation and has a valid Bank/Insurance guarantee".
- b) The employer/procuring entity may seek further clarification/confirmation if necessary to confirm authenticity/compliance of any condition of the tender. Further, in case of a discrepancy between the amounts stated in the appendix to Instructions to Tenderers in Section A of this tender document and the one stated in the tender advertisement or invitation letter, the bid security shall be taken as the amount in the tender advertisement/ letter of invitation.

The tenderers who do not satisfy any of the above mandatory requirements shall be considered Non-Responsive and their tenders will not be evaluated further.

## STAGE 2: TECHNICAL EVALUATION

The tender document shall be examined based on clause 2.2 of the Instruction to Tenderers which states as follows:

In accordance with clause 2.2 of Instruction to Tenderers, the tenderers will be required to provide evidence for eligibility of the award of the tender by satisfying the employer of their eligibility under sub clause 2.1 of Instructions to Tenderers and their capability and adequacy of resources to effectively carry out the subject contract.

In order to comply with provisions of clause 2.2 of Instruction to Tenderers, the tenderers shall be required;

- a) To fill the Standard Forms provided in the bid document for the purposes of providing the required information. The tenderers may also attach the required information if they so desire;
- b) On compliance with Technical Specifications, bidders shall supply equipment/items which comply with the technical specifications set out in the bid document. In this regard, the bidders will be required to submit relevant technical brochures/catalogues with the tender document, highlighting (using a mark-pen or highlighter) the Catalogue Number/model of the proposed items. Such brochures/catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:
  - (i) Standards of manufacture;
  - (ii) Performance ratings/characteristics;
  - (iii) Material of manufacture;
  - (iv) Electrical power ratings; and
  - (v) All other requirements as indicated in the technical specifications of the bid.

The bid will then be analyzed, using the information in the technical brochures, to determine compliance with key technical specifications for the works/items as indicated in the tender document. Bidders not complying with any of the key technical specifications shall be awarded 0 marks while those meeting all the key technical specifications shall be awarded 40 marks (evaluation committee may add more key requirements from the bid technical specifications).

The tenderer shall also fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipments they propose to supply.

## **A) ASSESSMENT FOR ELIGIBILITY**

The Sub-contractor shall be evaluated as follows;

- a) Assessment for Eligibility
- b) Compliance with Technical Specifications

## PARAMETERS

- (i) Key personnel
- (ii) Contract Completed in the last Three (3) years
- (iii) Schedules of on-going projects
- (iv) Schedules of Contractor's equipment
- (vi) Litigation History

TABLE 1: Assessment for Eligibility

Item	Description	Compliance √ or X
1.	Key Personnel (Attach evidence)	
	Director of the firm <ul style="list-style-type: none"> <li>• Holder of degree/ diploma in relevant field</li> </ul>	
	At least 1No. degree/diploma holder of key personnel in relevant Engineering field <ul style="list-style-type: none"> <li>• Has at least a minimum of 5 years of relevant experience</li> </ul>	
	At least 1No certificate holder of key personnel in relevant Engineering field <ul style="list-style-type: none"> <li>• Has at least a minimum of 5 years of relevant experience</li> </ul>	
	At least 2No Artisans with trade test certificate in relevant Engineering field <ul style="list-style-type: none"> <li>• Artisans with at least a minimum of 5 years of relevant experience</li> </ul>	
2.	Contracts completed in the last three (3) years (Max of 3No. Projects) - <u>Provide Evidence I.e. Award of Contracts and/or Completion Certificates</u> <ul style="list-style-type: none"> <li>• Projects of similar nature, complexity or magnitude</li> </ul>	
3.	On-going projects - <u>Provide Evidence I.e. Award of Contracts</u> <ul style="list-style-type: none"> <li>• Three and below Projects of similar, nature complexity and magnitude</li> </ul>	
4.	Schedule of contractor's equipment and transport (proof or evidence of ownership/Lease)	
	<ul style="list-style-type: none"> <li>• a) Relevant Transport (atleast 1No.) Means of transport</li> </ul>	
	<ul style="list-style-type: none"> <li>b) Relevant Equipment (at least 6No.) Must have the following equipment;                             <ol style="list-style-type: none"> <li>1. Motor and Phase Rotation Indicator</li> <li>2. Digital Earth Loop Tester</li> <li>3. Insulation Continuity Tester</li> <li>4. Digital Earth Resistance Tester</li> <li>5. Multimeter and Clamp Meter</li> <li>6. Electrician 's Tool Kit</li> </ol> </li> <li>• Has relevant equipment for works being tendered</li> </ul>	
5.	Litigation History <ul style="list-style-type: none"> <li>• Duly Filled</li> </ul>	
6	Compliance with Technical Specifications	
	COMPLIANCE STATUS	

## A) COMPLIANCE WITH TECHNICAL SPECIFICATIONS

### Note

On compliance with Technical Specifications, bidders shall supply equipment/items which comply with the technical specifications set out in the bid document. In this regard, the bidders will be required to submit relevant technical brochures/catalogues with the tender document, highlighting (using a mark-pen or highlighter) the Catalogue Number/model of the proposed items. Such brochures/catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:

- (i) Standards of manufacture;
- (ii) Performance ratings/characteristics;
- (iii) Material of manufacture;
- (iv) Electrical power ratings; and
- (v) All other requirements as indicated in the technical specifications of the bid.

The bid will then be analyzed, using the information in the technical brochures, to determine compliance with technical specifications for the works/items as indicated in the tender document. Bidders not complying with any of the technical specifications shall be adjudged to be technically non-responsive while those meeting all the technical specifications shall be adjudged to be technically responsive.

The tenderer shall also fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipment they propose to supply.

Tender Evaluation Committee to evaluate compliance to all technical specifications (Electrical & ICT installation Works) as detailed in the Section D (Particular specs) of this document.

The following table shall be used to determine the bidder's responsiveness to the technical specifications.

Table 2: Compliance to Technical Specifications

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>Compliance √ or X</b>
<b>I</b>	Lighting fittings	
2	Switches and Sockets	
3	Power Cables	
4	Distribution Board and MCBs	
5	CAT 6A Cable	
<b>6</b>	Network Switch	
7	Data Cabinet	
8	Fibre Optic Cable	
<b>9</b>	Uninterruptible Power Supply	
<b>I0</b>	Patch Panels	
<b>I1</b>	CCTV Cameras	
<b>I2</b>	Network Video Recorder (NVR)	
<b>I3</b>	75'' Interactive screen	
<b>I4</b>	Microphones	
<b>I5</b>	Speakers	
<b>I6</b>	30KVA 3 PHASE UPS	

Bidders to attach Technical Brochures/Catalogues for each proposed item.

The tenderers who do not satisfy any of the above mandatory requirements shall be considered

Non-Responsive and their tenders will not be evaluated further.

SECTION B

GENERAL SPECIFICATIONS

OF

MATERIALS AND WORKS

## **PART 1. GENERAL SPECIFICATIONS OF WORKS**

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- 1.2 Standard of Materials
- 1.3 Workmanship
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## **PART 2. GENERAL SPECIFICATIONS OF ELECTRICAL WORKS**

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- 2.2 M.C.B Distribution Panels and Consumer Units
- 2.3 Fused Switchgear and Isolators
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- 2.9 Armoured PVC Insulated and Sheathed Cables
- 2.10 Cable Supports; Markers and Tiles
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- 2.16 Sub-circuit Wiring
- 2.17 Space Factor
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- 2.19 Lighting Switches
- 2.20 Sockets and Switched sockets
- 2.21 Fused Spur Boxes
- 2.22 Cooker Outlets
- 2.23 Connectors
- 2.24 Lamp holders
- 2.25 LED Lamps
- 2.26 lighting Fittings Street lighting Lanterns
- 2.27 Position of Points and Switches
- 2.28 Street/Security Lighting Columns
- 2.29 Timing Control Switch
- 2.30 Wiring System for Street Lighting
- 2.31 Metal control Pillar
- 2.32 Current Operated Earth leakage circuit breaker
- 2.33 MV Switchboard
- 2.34 Steel Conduits and Steel Trunking
- 2.35 Testing on Site

# PART 1. GENERAL SPECIFICATIONS OF WORKS

## 1.1 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.

## 1.2 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.

## 1.3 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-contractors expense.

Permits, Certificates or Licenses must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licenses exist under Government legislation.

## 1.4 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.

## 1.5 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.

## 1.6 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.

## 1.7 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.

## 1.8 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.

## PART 2. GENERAL SPECIFICATIONS OF ELECTRICAL WORKS

### 2.1 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.

### 2.2 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: Ivory 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.

### 2.3 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.

## 2.4 CONDUITS AND CONDUIT RUNS

Conduit systems are to be installed so as to allow the loop-in system of wiring:

All conduits 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-contractors expense.

It will be the Sub-contractors 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.

## 2.5 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 be 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.

## 2.6 LABELS

Labels fitted to switches and fuse boards; -

- (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 switches
  - b) Special current rating
  - c) Item of equipment controlled
- (iv) Shall indicate on MCB panels
  - d) Reference number
  - e) Type of board, i.e., lighting, sockets, etc.,
  - f) Size of cable supplying panel
  - g) where to isolate feeder cable
- (v) Shall be generally not less than 75mm x 50mm.

## 2.7 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 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.

## 2.8 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
P.V.C 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 1.5mm<sup>2</sup> 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 to the details stated in the "Cable Braid and insulation Colours" Clause.

## 2.9 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.

## 2.10 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 cast cable hooks or clamps, of 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 galvanized 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.

#### 2.11 PVC INSULATED CABLES

Shall be of non-braided type as CMA reference 6491 x 600/1000/1000 volt grade cables, or equal approved.

PVC cables shall conform to the details of the "Cables and Flexible cords" and "Cable Braid and Insulation Colours" clauses.

#### 2.12 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.

#### 2.13 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).

## 2.14 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 Helleman 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.

## 2.15 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.

<u>SYSTEM</u>	<u>INSULATION COLOUR</u>	<u>CABLE END MARKER</u>
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

## 2.16 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.

- (i) 1.5mm<sup>2</sup> for all lighting circuits indicated on the drawing.

Power circuits P.V.C cable (minimum sizes).

- (i) 2.5mm<sup>2</sup> for one, two or three 5Amp sockets wired in parallel.
- (ii) 2.5mm<sup>2</sup> for one 15Amp socket.
- (iii) 2.5mm<sup>2</sup> 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.

#### 2.17 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 8.5 and 8.6 or as stated in Regulation 8.91, 8.117 and 8.118 of the I.E.E Regulations whichever is appropriate.

#### 2.18 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.

#### 2.19 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

#### 2.20 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

#### 2.21 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

#### 2.22 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

## 2.23 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.

## 2.24 LAMPHOLDERS

Shall be of extra heavy H.O skirted and shall be provided for every specified lighting fitting and shall be 8.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.

## 2.25 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

LED lamps shall be used in all fittings unless otherwise specified. The minimum luminous flux allowed is 95 lumens per Watt, minimum life time of 50,000hrs, minimum power factor of 0.9, voltage range of 100-240V, THD <15% amongst others.

## 2.26 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.

#### 2.27 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.

#### 2.28 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. 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.

#### 2.29 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 35mm<sup>2</sup> 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 or 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 enameled tubing and galvanizing 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 bend 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 15m. 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.

### 2.30 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.

- (b) Tests shall be carried out to prove that all single pole switches are installed in the 'live' conductor.
- (c) 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.
- (d) 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.
- (e) 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.
- (f) 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.
- (g) The Sub-contractor shall generally attend on other contractors employed on the project and carry out such electrical tests as may be necessary.
- (h) 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.
- (i) 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 Company Limited, and Communications Authority of Kenya (CA).

## GENERAL SPECIFICATIONS OF WORKS - ICT INSTALLATION WORKS

1. General
2. Standard of Materials
3. Workmanship
4. Procurement of Materials
5. Shop Drawings
6. Record Drawings
7. Regulations and Standards
8. Setting out Works

## 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. 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.

## 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-contractors expense.

Permits, Certificates or Licenses must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licenses exist under Government legislation.

## 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.

## 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.

## 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.

## 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.

## 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.

SECTION C

SCHEDULE OF CONTRACT DRAWINGS

## SCHEDULE OF CONTRACT DRAWINGS

1.0 There are currently no drawings in this contract.

The drawings shall however be availed, on award of the tender, to the sub-contractor.

SECTION D

PARTICULAR & TECHNICAL SPECIFICATIONS  
OF MATERIALS AND WORKS

## PART 1

### PARTICULAR SPECIFICATIONS OF MATERIALS AND WORKS

#### 1.0 SITE LOCATION

The location of the proposed works is at Coffee Plaza, Nairobi

#### 2.0 SCOPE OF WORKS

The works to be carried out under this sub-contract comprise of but not limited to the supply, installation, testing and commissioning of:

- Wiring and Installation of electrical fittings and accessories
- Installation of power distribution cables and control switchgear
- Installation of fire detection & alarm system
- Installation of power distribution board
- Trunking and conduiting works
- Telephone and data cabling terminations
- Optical fiber and terminations
- Data/voice outlets
- Equipment racks and cabinets
- UPS and backup batteries
- CCTV installation works
- Access control system installation works

#### 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. Alternative materials shall be accepted only after approval by the Project Manager.

#### 4.0 BROCHURES FOR ALL ELECTRICAL EQUIPMENT AND FITTINGS

For consideration and qualification tenderers shall, at their own cost, provide coloured manufacturer's brochures detailing technical literature and specifications of all the required telecommunication equipment where applicable.

## PART 2

### TECHNICAL SPECIFICATIONS OF MATERIALS AND WORKS

#### 1.00 TECHNICAL SPECIFICATIONS FOR LED LIGHT FITTINGS/LAMPS

LED PANEL LIGHT FITTING	
IEC Compliant	
Item	Minimum Specifications
Brand	State the brand, model and attach Technical Brochure (Mandatory)
Operating	<ul style="list-style-type: none"><li>&gt; voltage range: 130-300 V ac</li><li>&gt; frequency range: 45-55 Hz</li><li>&gt; Power factor &gt; 0.9 lagging</li><li>&gt; THD &lt;15%</li><li>&gt; Ambient temperature range -10 to +35 °Operating</li><li>&gt; Colour Consistency &lt; 5SDCM</li></ul>
Performance	<ul style="list-style-type: none"><li>&gt; luminous flux - 3600 lm</li><li>&gt; System efficacy &gt; 90lm/W</li><li>&gt; Lamp colour temperature (NW)4000K / (CW)6500K</li><li>&gt; Colour Rendering Index &gt;80</li><li>&gt; Median useful life &gt; 50,000 hrs</li><li>&gt; Luminaire light beam spread - 120°</li></ul>
Standards Compliance	CB/EMC/CE
General	<ul style="list-style-type: none"><li>&gt; Driver/power unit/transformer - PSU-E</li><li>&gt; Optical cover/lens type - Polystyrene bowl/cover prismatic</li><li>&gt; Protection class IEC - Safety class II (II)</li></ul>

#### 2.00 TECHNICAL SPECIFICATIONS FOR STRUCTURED CABLING & IP CCTV SURVEILLANCE SYSTEM

##### 2.01 EXTENT OF WORKS FOR IP CCTV SURVEILLANCE SYSTEM

The security surveillance system should consider the following.

IP CCTV Camera. The cameras specified should be able to cover the distance with clear pictures. Consider whether there shall be need to support the fixed digital cameras with the Pan, Tilt and Zoom Cameras or not. Highly sensitive areas should be covered with more cameras able to take pictures of any person coming in both from the front and the rear. The resolution of the cameras should be able to give motion pictures that are clear.

LED Monitors. The color monitors must be of high resolution and preferably of plasma screen. The size of the monitor should be big enough to allow the operators make correct deductions both in real time operation and during playbacks.

IP Network Video Recording. The recording multiplexer resolution has to be equally high for the monitor to display the with a high resolution.

The IP Surveillance system should be able to support the following:

- IP based recording system with motion detection
- Digital zooming into recorded images/ live view
- Multi-level password protection and logging facilities
- Image compression for remote web live and playback viewing in case of IP.
- Multi Display monitors
- Automatic daily archiving to hard drive or optical drive
- Fully adjustable digital video motion detection with exclusion/ inclusion multi regions per camera
- Efficient video collection, storage and retrieval
- Advanced and instant search capabilities
- Digitally signed recordings, with audit trails of all operator actions and system event
- Storage capacity of the Network Video Recorder. Space to provide at least three months continuous recording and backup for automatic archiving for one year and redundancy.
- Infrared illuminators in poor lighting conditions
- Able to interface with other systems on the ground
- Support IP and PoE connectivity

## 2.02 WORKING DRAWINGS

The Contractor shall submit to the Project Manager working drawings for the proposed system for approval. The drawings will show the locations for all IP cameras, cable routing and terminations, telecommunication outlets/ connectors, location of NVR, monitors and Edge switches.

## 2.03 MINIMUM REQUIREMENTS FOR THE PROPOSED IP CCTV SYSTEM

The cameras shall have the following minimum specifications but cameras with higher specifications shall be accepted:

### a) IP Dome/Bullet CCTV Camera

- 4 Mega Pixel Full HD IP Dome Camera with Infrared
- Built in Infrared 30 meters minimum imaging
- sensor with Wide Dynamic Range Motorized
- Varifocal Auto Iris lens (3-11mm) Minimum
- illumination 0.01lux (colour)
- IP network capable
- PoE capability
- H.265+ video compression
- 3D Noise reduction
- Accessible edge storage with internal MicroSD card slot
- Local Storage
- True day and night vision capability
- I/O - 1 Alarm in / 1 Alarm out
- 2 Way Audio
- Tampering detection, Face detection, Audio Detection, Motion detection & Privacy Masking and event triggered alarm processing
- Vandal proof IK-10 rating housing
- Weather proof IP66 rating

- ONVIF Compliant

(State make and type and enclose brochures/ catalogues)

#### 2.04 MOUNTING BRACKETS

The Brackets shall:

- Be suitable for wall or ceiling mounting of a single camera. Be at least 5.5"length
- Have an auto lock facility

#### 2.05 CAMERA HOUSING

The camera housing shall:

- Be IP66 rated with integral cable management.
- Be Weatherproof and constructed from aluminium with epoxy coating.

#### 2.06 COLOR VIDEO MONITORS

The monitor should be capable of providing high levels of picture quality 10MHz bars visible at low brightness and reliability stable synchronization, black level clamping, low sensitivity and high stability.

The monitors shall be high performance color video monitors for monitoring scenes from the above cameras and viewing playback scenes from the video cassette recorders. The monitors shall be located at places to be shown on site by the project manager.

The monitor shall give stable and interference free pictures of scenes being viewed. It shall also conform to the following specifications:

Type	:	LED; 50,000hours panel life
System	:	NTSC/PAL
Screen size	:	40
Resolution	:	min 1,920 x 1,080, upto 4K
Display Colour	:	16.0 million
Brightness	:	350cd/m <sup>2</sup>
Contrast Ratio	:	5,000:1
Video input signal	:	1.0 V pk-pk
Power consumption	:	Not more than 120W
Power input	:	240V 50HZ
Interface	:	VGA, DVI, HDMI, RGB, Audio, Video

(State make and type, and enclose catalogues)

#### 2.07 NETWORK VIDEO RECORDER

The network video recorder shall have the following minimum requirements:

- 32 Channels
- Recording speeds of at least 128Mbps for 32channel
- Gigabit Ethernet connection
- Multi-screen Display: Full/4/9/16 way or as appropriate.
- 2 Hot swap HDDs (RAID 5) at 4TB each
- external storage support capability
- VGA/HDMI local monitor
- Redundant hot swap power supply
- Network management/viewer software
- 
-

In built intelligent video analysis H.265+  
Compression

- ONVIF compatibility
- Web viewer supported
- PoE enabled
- Storage capacity : continuous storage for at least six (6) months and back up storage for at least one year
- Smart Video Search Feature for streamlined Investigations
- Recording resolution of 5MP minimum
- IP address filtering, user access log, authentication and encryption
- Auto Launch of Video on specified Alarms/Events
- LED status indicator
- CE,UL certification

(State make and type, and enclose catalogues)

## 2.08 CCTV MANAGEMENT SOFTWARE

CCTV management software with the following minimum specifications:-

- Event Recording Scheme
- Operate Motion-Dector-Recording
- NTSC-PAL video recording.
- Be capable of recording real time images at full resolution and frames rate.
- Features for connection for alarm system Automatic Recycling
- Users' passwords.
- Input, Output, Audio Alert Facilities
- Remote Viewing Facilities, TCP/IP, INTERNET, ISDN, modem
- Capability of streaming into client's existing LAN/ WAN infrastructure
- Ability to quickly search through thousands of hours of recorded video information
- Event-triggered video recording to reduce storage requirements
- Masks out disturbing areas, or areas of no interest, within the specified region
- Identifies & immediately alerts user to potential security breaches
- Features should be able to be used at very low frame rates
- Easy calibration for specific applications
- Color-matching matches user-specified colour to the video image
- Functions in outside environments with changing light conditions:
- Auto-learning of background feature
- Object saliency and object Consistency mechanisms to filter out phantom objects
- "Out of focus" condition is user-calibrated by level of Focus
- Automatic self-test of camera validity
- Motion Trajectory Analyzer provides advanced analysis of the motion of objects
- Seamless integration into Enterprise security knowledge management solution.
- Analysis of stationary objects

(State make and type, and enclose catalogues)

## 2.09 CABLING

- a) All cables must pass through conduits or trunking.
- b) All cables and connectors shall be labeled.
- c) No distortion due to kinks, sharp bends or excessive hauling tension shall be allowed.
- d) Cables shall be run in a manner eliminating any possibility of strain on the cable itself or on the terminations.
- e) Cables shall have no joints or splices.

- f) Cables shall be kept at a minimum distance of 150mm from items liable to become hot or cold.
- g) Bending radii shall be not less than eight times the overall cable diameter.
- h) The manufacturers hauling tension shall not be exceeded.
- i) All cable ties and fixings shall be tightened to support the cable loom without distortion of the cable sheath.
- j) The UTP 4 pair shall be of cat 6A grade and exceed ANSI/TIA/EIA-568-Aj and ISO/IEC 11001 standards. Cat 6A structured cabling shall be used throughout the entire installation.

Category 6A UTP 4-Pair Cable	
Item	Minimum Specifications
Brand	State the brand, model (Mandatory)
Construction	<ul style="list-style-type: none"> <li>• UTP</li> <li>• Nominal jacket OD: 8.5mm (0.33 in.)</li> <li>• 0.58mm (0.02 in.) solid (non-tinned) copper</li> <li>• Centre Isolation Member</li> </ul>
Jacket	Sequential meter markings
Wire characteristics	DC Resistance: <8.5 O/100m DC Resistance Unbalance: 2% Mutual Capacitance: 5.6 nF/100m Capacitance Unbalance:<160 pF/100m Characteristic Impedance(ohms):1 - 250 MHz: 100 ± 15% 100 - 750 MHz: 100 ± 22% NVP: 67% TCL: 30-10 log (f/100)dB PSANEXT: 62.5-15log(f /100)dB PSAACR-F:38.2-20log(f /100)dB Delay Skew: = 45ns
Industry Compliance	<ul style="list-style-type: none"> <li><input type="checkbox"/> ISO/IEC 11801 Ed. 2.2 (Class EA)</li> <li><input type="checkbox"/> ISO/IEC 61156-5 (Category 6A)</li> <li><input type="checkbox"/> TIA-568-C.2 (Category 6A)</li> <li><input type="checkbox"/> LSOH: ISO/IEC 60332, IEC 60754, IEC 61034</li> <li><input type="checkbox"/> EN50399 Class Eca</li> </ul>
Physical Properties	Pulling Tension (max):110N (25 lbf) Bend Radius (min): 45.7mm (1.8 in.) Installation Temperature: 0 to 60°C (+32 to 140°F) Storage Temperature: -20 to 75°C (-4 to 167°F) Operating Temperature: -20 to 60°C (-4 to 140°F)

(State make and type, and enclose catalogues)

## 2.10 PATCH PANELS

- a) Shall conform to ANSI/TIA/EIA-568A and rack mounted.
- b) Shall be equipped with RJ45 contacts of Cat 6A sockets with capacity of 12, 24 or 48 ports.
- c) Shall be earthed.
- d) Except for patch cords used to connect NICs to the RJ45 sockets, all patch cords shall be labeled at each extremity with PVC support and intelligible marking. For other components the label shall be of stiff plastic PVC type.

Item	Cat 6A UTP Patch Panel Minimum specifications
Brand	State the brand, model and attach Technical Brochure (Mandatory)
Ports	24/48 Ports
Characteristics	<p>Operating Temperature: -10 to 60 °C, (14 to 140 °F) Flammability Rating: UL 94 V-0</p> <p>Green Features: RoHS, lead-free, halogen-free, PVC free</p> <p>Plastic Materials Flame retardant thermoplastic</p> <p>Dimensions (LxWxH):109.2 mmx 482.6mm x 44.2mm (4.30"x19.00" x1.74 " )</p> <p>Mounting: CEA-310-E 19-inch (482.6mm) rack</p> <p>Material - Panel: 18 gauge cold rolled steel, black e-coat Ground Lug Attachment: 3/8" 1 hole or two-hole lug (1"spacing)</p>
Industry Compliance	<p>STANDARDS COMPLIANCE</p> <ul style="list-style-type: none"> <li>• ANSI/TIA-568-C.2</li> <li>• ISO/IEC 11801 Ed2.2</li> <li>• ETL Tested</li> <li>• IEC 60603-7</li> <li>• IEC 60603-7-51</li> <li>• IEEE 802.3an</li> <li>• IEEE 802.3af (PoE)</li> <li>• IEEE 802.3at (PoE+)</li> <li>• ANSI/TIA-1096-A</li> </ul>
Warranty	<p>End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement)</p> <p>Minimum 5 Years</p>

(State make and type, and enclose catalogues)

## 2.11 NETWORK CONTROL EQUIPMENT AT THE NETWORK CORE

The active control equipment at the core should have the following features:

- a) Backplane/switch fabric Bandwidth Capacity of 150 GBPS or more.
- b) IEEE 802.3 compliant for power over Ethernet
- c) IEEE 802.1 based security compliant
- d) SNMP compliant for security
- e) Layer 2/3/4 switch

- f) Should support Gigabit Ethernet to the desktop
- g) Should have at least 12-slots
- h) The core switches should have two links to each edge switch configured in active/active configuration. The links should deliver 2GBPS throughput when all ports are active.
- i) The core switch should have redundant power supply, redundant fan tray and redundant CPU/ supervisor engine installed
- j) Fiber cable linking stacks on each edge switch to the core should be connected to 1000Base X(GBIC) port on the core switch using star topology
- k) Should be installed with the latest version of system software at the time of delivery.
- l) Should support Quality of service for various applications.
- m) Active devices shall be rack mounted.
- n) Active devices used at the LAN edge must be stackable and shall attach to the backbone cabling at 1000mbps.
- o) Where more than one active device is required to satisfactorily serve the floor data outlet distribution requirements they shall be stacked using interface operating at the backbone speed.  
(State make and type, and enclose catalogues)

## 2.12 LABELING

- a) Horizontal and backbone cables shall be labeled at each end. The cable or its label shall be marked with its identifier.
- b) A unique identifier shall be marked on each faceplate to identify it as connecting hardware.
- c) Each port on the face plate shall be labeled with its identifier.
- d) A unique identifier shall be marked on each piece of connecting hardware to identify it as a connecting hardware.
- e) Each port on the connecting hardware shall be labeled with its identifier.
- f) A unique identifier shall be marked on each port on the connecting faceplate to identify it as a connecting hardware.

## 2.13 NETWORK CABINET

- a) The cabinet shall be metallic with front clear glass and of good finish and conveniently accessible by technical personnel for maintenance. The main cabinet shall be at least 12U and other cabinets housing edge switch should be at least 9U
- b) Power to the cabinet shall be switched off from within the cabinets. Proper power socket cables to be supplied with the cabinet.
- c) The cabinet for active devices shall conform to ANSI/TIA/EIA-568A specifications with forced cooling.
- e) Support small factor pluggable (SFP) and industry leading density up to 240 of IEEE 8033 for 1000 Base-SX ports per system.
- c) Cabinets shall have adequate room for additional components typically 3U free space.  
(State make and type, and enclose catalogues)

## 2.14 ETHERNET FLOOR EDGE SWITCHES

Active control equipments at the LAN Edge should have the following features

- a) Active control equipments at the LAN Edge should support 10/100/1000 MBPS on all ports (RJ45) and Gigabit to the desktop connectivity
- b) The equipments should have at least two 1000BaseXGigabit uplink ports for terminating backbone Fiber.

- c) The equipments should support layer 3 routing.
  - d) Should support IEEE 802.1, SSH, SNMP.
  - e) Switch Fabric forwarding Bandwidth of 64GBPS or more.
  - f) More than 12,000MAC addresses should be available on each switch .
  - g) The switches should have 12 ports of 10/100/1000 MBPS.
  - h) Each stack on the edge will have two links of Fiber to the core switch, totaling two fiber terminations from the core switch to the stack.
  - i) Should support Jumbo frames.
  - j) Total stack throughput bandwidth of 16 GBPS or more.
  - k) Active Edge switches should be quoted with a minimum of One year of warranty covering free replacement of parts and units.
  - l) The switches to be PoE plus
- (State make and type, and enclose catalogues)

2.15 OPTICAL FIBRE CABLE

The fibre cable must be 8 core single mode fibre with the following specifications:-

- a) Cable size: 8 cores.
- b) Termination: SC Duplex connectors.
- c) Graded Index: Nominal 62.5/125 micron

Item	Minimum Specifications
Brand	State the brand, model (Mandatory)
Construction	Steel Tape armoured with Glass Yarn
Armour	Corrugated Steel Tape Armour
Cable characteristics	<ul style="list-style-type: none"> <li>- Support for 10GBASE-T</li> <li>-Low Density Polyethylene Sheath</li> <li>-Gel Filled Loose Buffer Tube</li> <li>-Level 1 Rodent Protection</li> <li>- Crash(N) at least 2500</li> <li>-Torsion (Turns/M) not more than 5 Multimode</li> </ul>
Fibre Specificatons	-8-Core indoor Premium fiber meeting IEEE 802.3 10 Gigabit ethernet Standard as well as IEC-60793-2-10 and TIA-492AAAC specifications for laser bandwidth Differential Mode Delay(DMD) specifications
	<ul style="list-style-type: none"> <li>- 900 <math>\mu</math>m tight buffer</li> <li>- 250<math>\mu</math>m coated optical fibre</li> <li>- Length markings in 2 ft. increaments</li> <li>- Available in OFNR, OFNP and LSOH constructions</li> <li>- jacket Material is Lead Free</li> <li>- RoHS compliant</li> </ul>
Industry Compliance	- ISO/IEC 11801:2002 OM3

-ANSI/TIA/EIA-568-B.3	
- ANSI/TIA/EIA-568-B.3-1	
	<ul style="list-style-type: none"> <li>- ANSI/TIA-598-C</li> <li>- Telcordia GR-409-CORE</li> <li>- LSOH: IEC 60332-1, IEC 61034, IEC 60754</li> <li>- OFNR: Communications Type OFNR(UL) and FT4 c(UL)</li> <li>- TIA-492AAAC laser bandwidth DMD specification</li> </ul>
- IEC 60793-2-49 and TIA/EIA 455-220 DMD measurement test procedure	

(State make and type, and enclose catalogues)

2.16 FIBER PATCH PANELS

All Backbone Fiber links should be terminated on Fiber Patch Panels. Connector interfaces should support ST, Sc simplex, Sc duplex, FC, LC or MT-RJ.

(State make and type, and enclose catalogues)

2.17 BACK BONE

Backbone cabling inclusive of switches and all necessary accessories shall be carried out in readiness for the termination of edge switches.

Backbone cabling shall be flexible and allow for easy 'add ons' for future expansions. Hence enough capacity shall be allowed for future expansion. It shall be done using the star topology.

## 2.20 TECHNICAL SPECIFICATIONS FOR 2KVA UPS

DESCRIPTION	MINIMUM SPECIFICATIONS	
Output	<ul style="list-style-type: none"> <li>&gt; Max Configurable Power (Watts) - 2.5KWatts/ 2.0KVA</li> <li>&gt; Output Voltage Note - Configurable for 220 : 230 or 240 nominal output voltage</li> <li>&gt; Output Voltage Distortion - Less than 2 %</li> <li>&gt; Output Frequency (sync to mains) - 50/60 Hz +/- 3 Hz Sync to mains</li> <li>&gt; Other Output Voltages - 220, 240</li> <li>&gt; Load Crest Factor - 3 : 1</li> <li>&gt; Topology - Double conversion online</li> <li>&gt; Waveform type - Sine wave</li> <li>&gt; Bypass - Internal bypass (automatic and manual)</li> </ul>	
Input	<ul style="list-style-type: none"> <li>&gt; Input frequency - 40 - 70 Hz Auto-sensing</li> <li>&gt; Input voltage range for main operations - 100 - 275 Adjustable (half load), 160 - 275V</li> <li>&gt; Number of Power Cords - 3</li> <li>&gt; Other Input Voltages - 220, 240</li> </ul>	
Batteries and Runtime	<ul style="list-style-type: none"> <li>&gt; Battery type - Lead-acid battery</li> <li>&gt; Typical recharge time - 3hour(s)</li> <li>&gt; Nominal Battery Voltage - 96 V</li> <li>&gt; Expected Battery Life (years) - 3 - 5</li> <li>&gt; RBC Quantity - 1</li> <li>&gt; Battery Charge Power (Watts) - 168 Watts</li> <li>&gt; Extendable Run Time - 1</li> <li>&gt; Battery Volt-Amp-Hour Capacity - 505</li> </ul>	
Communications & Management	<ul style="list-style-type: none"> <li>&gt; Interface Port(s) - RJ-45 Serial, Smart-Slot, USB</li> <li>&gt; Control panel - Multifunction LCD status and control console</li> <li>&gt; Audible Alarm - Audible and visible alarms prioritized by severity</li> <li>&gt; Emergency Power Off (EPO) - Yes</li> <li>&gt; Available SmartSlot** Interface Quantity - 1</li> </ul>	
Environmental	<ul style="list-style-type: none"> <li>&gt; Operating Temperature - 0 - 40 °C</li> <li>&gt; Operating Relative Humidity - 0 - 95 (Non-condensing) %</li> <li>&gt; Operating Elevation - 0 - 3048meters</li> <li>&gt; Storage Temperature - (-15 - 45 °C)</li> <li>&gt; Storage Elevation - 0 - 15240meters</li> <li>&gt; Audible noise at 1 meter from surface of unit - 55.0dBA</li> <li>&gt; Online thermal dissipation - 703.0BTU/hr</li> <li>&gt; Protection Class - IP20</li> </ul>	
Conformance	<ul style="list-style-type: none"> <li>&gt; Approvals - CE, CE Mark, EAC, EN/IEC 62040-1, EN/IEC 62040-2, RCM, VDE</li> <li>&gt; Standard warranty - 3 years repair or replace (excluding battery) and 2 years for battery</li> </ul>	
Surge Protection	<ul style="list-style-type: none"> <li>&gt; Surge energy rating - 340Joules</li> </ul>	

2.21 65" LED DISPLAY SCREEN

DESCRIPTION	MINIMUM SPECIFICATIONS
Display	<ul style="list-style-type: none"> <li>&gt; Technology - LED</li> <li>&gt; Display Type - UHD</li> <li>&gt; Screen Size - 65"</li> <li>&gt; Resolution - 1920 x 1080 or higher</li> <li>&gt; Contrast Ratio - 5000:1</li> <li>&gt; Aspect Ratio - 16:9 4:3</li> </ul>
Video (Picture Quality)	<ul style="list-style-type: none"> <li>&gt; HDR - 4K Active HDR</li> <li>&gt; Dynamic Tone Mapping - HDR Dynamic Tone Mapping</li> <li>&gt; Upscaler - 4K Upscaler</li> <li>&gt; Noise Reduction - NR</li> <li>&gt; HEVC (Video Decoder) - 4K@60P, 10bit</li> <li>&gt; VP9 (Video Decoder) - 4K@60P, 10bit</li> <li>&gt; Picture Mode - Yes 9 modes (Vivid, Standard, Eco, Cinema, Sports, Game, HDR Effect, (ISF) Expert (Bright Room), (ISF) Expert (Dark Room))</li> </ul>
Audio	<ul style="list-style-type: none"> <li>&gt; Two built in stereo speakers</li> </ul>
Built In Audio Decoders	<ul style="list-style-type: none"> <li>&gt; BBE Digital, Virtual Dolby Surround Sound</li> </ul>
Digital Comb Filter:	<ul style="list-style-type: none"> <li>&gt; With Digital comb filter</li> </ul>
Digital cable:	<ul style="list-style-type: none"> <li>&gt; Digital Cable Ready</li> </ul>
Progressive Scan	<ul style="list-style-type: none"> <li>&gt; With Progressive Scan</li> </ul>
Supported HD Broadcast	<ul style="list-style-type: none"> <li>&gt; 720 P, 576 P, 1080i, 480 P, 576i</li> </ul>
Formats	<ul style="list-style-type: none"> <li>&gt; PAL, SECAM, NTSC</li> </ul>
DTV Capability	<ul style="list-style-type: none"> <li>&gt; Ready</li> </ul>
Picture-in-Picture (PIP):	<ul style="list-style-type: none"> <li>&gt; With (PIP)</li> </ul>
Inputs supported:	<ul style="list-style-type: none"> <li>&gt; Component, Composite Video, VGA, DVI, HDMI (3), USB, Stereo Audio</li> </ul>
Outputs Supported:	<ul style="list-style-type: none"> <li>&gt; Component, VGA, DVI, HDMI, Stereo Audio</li> </ul>
Physical Characteristic	<ul style="list-style-type: none"> <li>&gt; Wall mountable</li> </ul>

## AUDIOVISUAL SYSTEM

### 1. CEILING LOUDSPEAKERS

ITEM	MINIMUM SPECIFICATIONS
Nominal Sensitivity	86 dB
Rated Impedance	16 Ohm
Frequency Range	80Hz – 20kHz
Power Capacity	80W Continuous
Nominal Coverage Angle	130° Conical Coverage
Size	4.0"

## 2. CEILING SUB-WOOFERS

ITEM	MINIMUM SPECIFICATIONS
Nominal Sensitivity	89 dB
Rated Impedance	8 Ohm
Frequency Range	42Hz – 200Hz
Power Capacity	200W Continuous
Nominal Coverage Angle	180° Conical Coverage
Size	8.0”

## 3. CEILING SPEAKERS/SUBWOOFER AMPLIFIER

ITEM	MINIMUM SPECIFICATIONS
Mounting	Rack Mount
Channels	2 No.
Input per Channel	Dual RCA and 3 Pin Euro-Block
Power Output per Channel	300W @ 4 Ohms
THD +Noise	< 0.5%
SNR	>97 dB
Crosstalk	<70 dB
Frequency Response	20Hz – 20kHz ±1dB
Limiters	Inbuilt

## 4. MEETING SPACE COLLABORATION SYSTEM

ITEM	MINIMUM SPECIFICATIONS
Web Conferencing	Zoom and Skype for Business
Viewers	MS Powerpoint, Word & Excel
	Adobe PDF
Web Browser	Integrated
Inputs	4 No. 3.0 USB
	Analog 1/8” Mini Stereo Jack
Outputs	Analog 1/8” Mini Stereo Jack
	2 No. HDMI
Connectivity	Wi-Fi: 802.11 a/b/g/n/ac
	Wired RJ-45

5. DIGITAL VIDEO PRESENTATION SWITCHER

ITEM	MINIMUM SPECIFICATIONS
Mounting	Rack Mount
Video Inputs	4 No. HDMI Female Ports
Switcher Control	8 No. Source Select Buttons
Control Features	Display Mute/Unmute Functions
	Windowing with Scaling (Side-by Side, Top-Bottom and Picture-in-Picture)
Video Outputs	2 No. HDMI Female Ports
	8 x 1:3 4K60 4:4:4 Video Switching
Audio Inputs	6 No. 5 Position Captive Wire Terminals
Audio Output	2 No. Line Level Audio
DSP	10 Band Parametric Equalizer
	Input Gain Adjustment
	Variable Compression
	Advanced Feedback Suppression

6. WEB CONFERENCING CAMERA

ITEM	MINIMUM SPECIFICATIONS
Lens	1/ 2.8” CMOS, 2.14 Mega Pixel
	1080p Resolution
	61° Wide Viewing Angle
	10x Optical Zoom
Frame Rate	30 fps
Control	Pan & Tilt with 64 Presets
	Remote Control
Outputs	USB 3.0

7. DISPLAY MONITOR

ITEM	MINIMUM SPECIFICATIONS
Size	55”
Type	LED
Aspect Ratio	16:9
Resolution	4K (3840 x 2160)

#### 8. CHAIRMAN MICROPHONE STATION

ITEM	MINIMUM SPECIFICATIONS
Mounting	Heavy Duty Table Stand
Control	Master Volume Adjustment
Connection	Bus Connection via. 8 Pin DIN Conector
Outputs	Inbuilt Speaker
	3.5mm Headphone Jack
Bandwidth	50Hz – 20kHz
THD + Noise	<0.1%
SNR	>80 dB
Power	Powered by Base Units

#### 9. DELEGATE MICROPHONE STATION

ITEM	MINIMUM SPECIFICATIONS
Mounting	Heavy Duty Table Stand
Control	Speaking Request Button
Connection	Bus Connection via. 8 Pin DIN Conector
Outputs	Inbuilt Speaker
	3.5mm Headphone Jack
Bandwidth	50Hz – 20kHz
THD + Noise	<0.1%
SNR	>80 dB
Power	Powered by Base Units

#### 15. MIXING CONSOLE

ITEM	MINIMUM SPECIFICATIONS
Mounting	Rack Mount
Inputs	16 Mic and 8 Line
Outputs	16 XLR Line Outs
Connectivity	RJ45 Ethernet
DSP	4 Band Parametric EQ
	Input Gain, Mute and Faders
	Master Fader

10. EQUIPMENT POWER SUPPLY UNIT

ITEM	MINIMUM SPECIFICATIONS
Mounting	Rack Mount
Input	1 No. C-Form 240V IP44 Inlet
Output	7 No. Universal Sockets
Protection	Circuit Breaker Overload Protection
Display	LCD Power Monitor

11. COMPUTER

ITEM	MINIMUM SPECIFICATIONS
Mounting	Rack Mounted
Processor	Intel Xeon E-Series 3.4 GHz 8 Cores
RAM	16GB
Storage	1TB GB Hot Plug SSD
Operating System	Windows 10

12. CONFERENCE SYSTEM BASE UNIT

ITEM	MINIMUM SPECIFICATIONS
Mounting	Rack Mount
Capacity	40 Microphone Units
Control	Maximum No. of Active Microphones
	Bass, Treble and Master Volume Adjust
Conference Modes	Override, Normal, Free and Request
Inputs	1 No. Balanced XLR
	1 No. 2 Channel Audio
	8 Pin DIN Connector for Microphones
Outputs	1 No. Balanced XLR
	1 No. 2 Channel Audio

### 13. LED Interactive Screen

Display	Function	Structure
Size: 75"	Audio Output Power: 15W * 2	Net Weight: TBD
Resolution: 3840*2160 (UHD)	Frequency band: 2.4GHz/5GHz	Gross Weight: TBD
Brightness: 400cd/m <sup>2</sup>	WiFi standard: 802.11a/b/g/n/ac	Product Size (W*D*H): 75" 1716 5x86 9x1031 8mm
Contrast ratio: 1200:1	Bluetooth: 2.1+EDR/4.2/5.1	
Backlight type: D-LED		
Pixel pitch: 0.4296mm(H)*0.4296mm(V) frequency: 50Hz	<b>Environment</b>	Package Size (W*D*H): 75" 1860x185x1125mm
	Working Temperature: 0°C ~ 40°C	Housing Material (Surface Frame /Back Cover): Aluminum/Sheet Metal
	Storage Temperature: -10°C ~ 60°C	Housing Color (Surface Frame /Back Cover): Dark Gun/Black
	Working Humidity: 20% ~ 80% non-condensing	
	Storage Humidity: 10% ~ 80% non-condensing	
	The longest service time (Hour*Day): 18Hours*7days	<b>Power</b>
Viewing angle: 178°(H)/178°(V)	<b>Ports</b>	Voltage: 100 V ~ 240 V/AC, 50 Hz
Color gamut (x% NTSC): 72%	HDMI IN *2, DP IN *1, HDMI OUT *1, LAN *2,	Power consumption without OPS: 380W-415W
View area: 1649.664(H)x927.936 (V)	USB *2, Touch-USB *3, MIC IN *1, S/PDIF OUT *1,	OPS Power: 18V(DC)/5A
Display colors: 1.07G(8bit+FRC)	Audio OUT *1, RS232 *1, Type-c *1, USB 3.0 *2,	Power consumption in standby mode: <0.5W
Lifespan: 50,000 hrs	Touch USB *1, HDMI IN *1	Power (AC) input: *1
<b>System</b>	<b>Accessories</b>	
OS: Android 11.0	3m Power Cord *1, Pen *2, Certificate of quality *1,	
CPU: CA55	User Manual *1, Warranty card *1, Wall-mounted bracket *1 set *1 mounting structure	
CPU Working Frequency: 1.2~1.53GHz		
CPU Core: Quad		
GPU: G52 2EE MC1@550MHz		
RAM: 4GB DDR4		
ROM: 32GB Standard		

14. 75" LED DISPLAY SCREEN

DESCRIPTION	MINIMUM SPECIFICATIONS
Display	<ul style="list-style-type: none"> <li>&gt; Technology - LED</li> <li>&gt; Display Type - UHD</li> <li>&gt; Screen Size - 75"</li> <li>&gt; Resolution - 1920 x 1080 or higher</li> <li>&gt; Contrast Ratio - 5000:1</li> <li>&gt; Aspect Ratio - 16:9 4:3</li> </ul>
Video (Picture Quality)	<ul style="list-style-type: none"> <li>&gt; HDR - 4K Active HDR</li> <li>&gt; Dynamic Tone Mapping - HDR Dynamic Tone Mapping</li> <li>&gt; Upscaler - 4K Upscaler</li> <li>&gt; Noise Reduction - NR</li> <li>&gt; HEVC (Video Decoder) - 4K@60P, 10bit</li> <li>&gt; VP9 (Video Decoder) - 4K@60P, 10bit</li> <li>&gt; Picture Mode - Yes 9 modes (Vivid, Standard, Eco, Cinema, Sports, Game, HDR Effect, (ISF) Expert (Bright Room), (ISF) Expert (Dark Room))</li> </ul>
Audio	<ul style="list-style-type: none"> <li>&gt; Two built in stereo speakers</li> </ul>
Built In Audio Decoders	<ul style="list-style-type: none"> <li>&gt; BBE Digital, Virtual Dolby Surround Sound</li> </ul>
Digital Comb Filter:	<ul style="list-style-type: none"> <li>&gt; With Digital comb filter</li> </ul>
Digital cable:	<ul style="list-style-type: none"> <li>&gt; Digital Cable Ready</li> </ul>
Progressive Scan	<ul style="list-style-type: none"> <li>&gt; With Progressive Scan</li> </ul>
Supported HD Broadcast	<ul style="list-style-type: none"> <li>&gt; 720 P, 576 P, 1080i, 480 P, 576i</li> </ul>
Formats	<ul style="list-style-type: none"> <li>&gt; PAL, SECAM, NTSC</li> </ul>
DTV Capability	<ul style="list-style-type: none"> <li>&gt; Ready</li> </ul>
Picture-in-Picture (PIP):	<ul style="list-style-type: none"> <li>&gt; With (PIP)</li> </ul>
Inputs supported:	<ul style="list-style-type: none"> <li>&gt; Component, Composite Video, VGA, DVI, HDMI (3), USB, Stereo Audio</li> </ul>
Outputs Supported:	<ul style="list-style-type: none"> <li>&gt; Component, VGA, DVI, HDMI, Stereo Audio</li> </ul>
Physical Characteristic	<ul style="list-style-type: none"> <li>&gt; Wall mountable</li> </ul>

**SECTION E**  
**SCHEDULE OF UNIT RATES**

## SCHEDULE OF UNIT RATES

1. The tenderer shall insert unit rates against the items in the following schedules and may add such other items as he considers appropriate.
2. The unit rates shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation under this contract.
3. The unit rates will be used to assess the value of additions or omissions arising from authorised variations to the contract works.
4. Where trade names or manufacturer's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of article or quality of material required. Alternative brands of equal and approved quality will be accepted.
5. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including V.A.T, Withholding tax and all other taxes applicable at the time of tender).
6. Any bid returned with unfilled Schedule of Unit Rates shall be considered technically non-responsive, and the bidder shall automatically be disqualified.

SCHEDULE OF UNIT RATES  
(MUST be completed by the Tenderer)

NO	DESCRIPTION	QTY	UNIT	UNIT RATE
				KSHS
1	<b>Cables:</b> a) <b>Single Core PVC Cables</b>			
	i) 10mm <sup>2</sup>	1	Lm.	
	ii) 25mm <sup>2</sup>	1	Lm.	
2	<b>PVC/SWA/PVC Armoured Copper cables per meter</b>			
	a) 10.0mm sq. 2 core	1	Lm.	
	b) 16.0 mm sq 4 core	1	Lm.	
3	<b>Consumer Units and Distribution Boards as Schneider Electric or an approved equivalent;</b>			
	a) 18 Way SPN with integral 100A Isolating Switch	1	No.	
	b) 10 Way TPN with integral 100A Isolating Switch	1	No.	
	c) 10 Way SPN with integral 100A Isolating Switch	1	No.	
	d) 8 Way TPN with integral 100A Isolating Switch	1	No.	
4	<b>Miniature Circuit Breakers</b>			
	a) 6A	1	No.	
	b) 50A			
	c) 80A	1	No.	
5	<b>10A moulded ivory switch plates as MK, Clipsal, BG, Crabtree or approved equivalent as follows:</b>			
	a) 2 gang 1 way	1	No.	
	b) 3 gang 2 way	1	No.	
6	<b>HG PVC Conduits</b>			
	a) 32mm	1	No	
	b) 50mm	1	No	
7	<b>Cable Trunking</b> Two compartment trunking manufactured in 14 SWG steel sheet and finished in cream powder coating with the following dims;			
	a) 50x25mm	1	Lm.	
	b) 100x50mm	1	Lm.	
	c) 200x50mm	1	Lm.	

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Qty</b>	<b>Rate (Kshs)</b>
1.	48 port edge switch POE capabilities	No.	1	
2.	Single port Cat 6A angled Faceplate	No	1	
3.	5KVA single phase UPS	No	1	
4.	9U Wall Mounted cabinet	No.	1	
5.	12 port CAT6A data patch panel	No.	1	
6.	CAT6A SFTP Cable as Siemon	No.	1	
7.	12 Port Fibre Patch Panel	No.	1	
8.	CAT 6E UTP 4-Pair Cable	No.	1	
9.	6 core Single mode fiber cable	No.	1	
10.	Heavy duty electric strikes	No.	1	
11	64 Port Network Video Recorder	No.	1	
.				

**SECTION F**  
**BILLS OF QUANTITIES**

## 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.I in this Section. Where the sub-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:-

#### **a) Preliminaries – Bill 1**

Sub-contractors preliminaries are as per those described in section C – sub-contractor preliminaries and conditions of contract. The sub-contractor shall study the conditions and make provision to cover their cost in this Bill. The number of preliminary items to be priced by the Tenderer has been limited to tangible items such as site office, temporary works and others. However the Tenderer is free to include and price any other items he deems necessary taking into consideration conditions he is likely to encounter on site.

#### **b) Installation Items and 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 I.05 of the section C.

#### **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 sub-contractor 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

## **B) NOTES FOR 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. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including **16% V.A.T and all taxes applicable at the time of tender.**
- 3 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.
4. 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 to. Otherwise alternative brands of **equal** and **approved** quality will be accepted.

Should the sub-contractor install any material not specified here in before receiving **approval** 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.**

6. Tenderers must enclose, together with their submitted tenders, detailed **manufacturer's Brochures** detailing Technical Literature and specifications on the items they intend to offer.

**This shall be used in the tender evaluation to determine the first line aesthetics and quality of fittings offered.**

**ELECTRICAL INSTALLATION WORKS FOR THE PROPOSED RENOVATIONS AT COFFE  
PLAZA (HEADQUARTERS COFFEE DIRECTORATE)  
WP ITEM NO. D116 NB/NB/2102 JOB NO 10382C  
ELECTRICAL ENGINEERING SERVICES INSTALLATION WORKS  
BILL NO.1: PRELIMINARIES**

<b>Item</b>	<b>Description</b>	<b>Qty</b>	<b>Unit</b>	<b>Rate</b>	<b>Amount</b>
1	Discrepancies clause 1.02				
2	Conditions of sub-contract Agreement clause 1.03				
3	Payments clause 1.04				
4	Site location clause 1.06				
5	Scope of contract works clause 1.08				
6	Extent of contractors duties clause 1.09				
7	Firm price contract clause 1.12				
8	Variation clause 1.13				
9	Prime cost and provisional sum clause 3.14 (insert profit and attendance which is a percentage of expended PC or provisional sum				
10	Bond clause 1.15	1	item		
11	Government legislation and regulations clause 1.16				
12	Import duty and VAT clause 1.17 (Note this clause applies for materials supplied only VAT will also be paid by the subcontractors as allowed in the summary page)				
13	Insurance company fees clause 1.18	1	Item		
14	Provision of services by the Main contractor clause 1.19				
15	Samples and materials generally clause 1.21				
16	Supplies clause 1.20				
17	Bills of quantities clause 1.23				
18	Contractors office in Kenya clause 1.24				
19	Builders work clause 1.25				
20	Setting to work and regulating system clause 1.29				
21	Identification of plant components clause 1.30				
22	Working drawings clause 1.32	1	Item		
23	Records Drawings (As Installed) and instructions clause 1.33	1	Item		
24	Maintenance Manual clause 1.34				
<b>Sub Total carried to Page F/4</b>					

Item	Description	Qty	Unit	Rate	Amount
	<b>Total C/F from Page F/3</b>				
25	Hand over clause 1.35				
26	Painting clause 1.36				
27	Testing and inspection - manufactured plant clause 1.38				
28	Testing and inspection - installation clause 1.39				
29	Storage of materials clause 1.41	1	Item		
30	Initial Maintenance Clause 1.42				
31	Attendance Upon Tradesmen etc (Insert percentage only) clause 1.58				
32	Local and other authorities notice clause 1.60				
33	Temporary Works clause 1.63				
34	Patent Rights clause 1.64				
35	Mobilization and Demobilization clause 1.65				
36	Extended preliminaries clause 1.66 (see Appendix - clause 1.70)				
38	Allow for taxes, profit and attendance for the above item	1	item		
39	Amendment to Scope of subcontract works clause 1.68				
40	Contract obligation and employers obligation clause 1.69				
41	Any other preliminaries				
<b>Total for Bill No 1- Preliminaries carried forward to price summary page</b>					

**BILL No. 2: GROUND FLOOR**

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>A.</b>	<b>SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING:- LIGHTING POINTS AND SWITCHES</b>				
2.01	Lighting points wired in 3 x 1.5mm <sup>2</sup> PVC/SC CU cables drawn in 20mmØ surface mounted HG/PVC conduits complete with all necessary accessories but excluding switches for:- i) One way switching ii) Two way switching	18 60	No. No.		
2.02	10A, moulded plastic ivory white switch plates as MK or approved equivalent as follows:- i) One gang one way ii) Two gang two way	15 12	No. No.		
2.03	Lighting fittings complete with lamps of appropriate wattage and colour rendering and fixing materials as follows:- i) 36W, 3600lm 600X600 LED fitting as Philips Smartbright LED panel or approved equivalent for lift lobbies  ii) Emergency circular /square surface luminaire with opal diffuser and white polycarbonate body for non-maintained emergency lighting for 3 hour duration as Philips or Approved Equivalent for lift lobbies ii) 12W, wall lights as Philips or approved equivalent	20  4 6	No.  No. No.		
<b>B.</b>	<b>POWER POINTS</b>				
2.04	Raw power socket outlet power points comprising wiring in 3 x 2.5mm <sup>2</sup> PVC/SC CU cables drawn in 25mmØ concealed HG PVC conduits/trunking including all conduit accessories but excluding plates	10	No.		
2.05	13A moulded switched socket outlet plates as MK or approved equivalent as follows: i) Twin switched	10	No.		
<b>Total carried to Bill No 2 Collection Page</b>					



<b>BILL No. 2 COLLECTION PAGE</b>		
<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
1	TOTAL B/F Page F/5.....	
2	TOTAL B/F Page F/6 .....	
<b>Total for Bill No. 2: C/F to Bills Summary Page</b>		

**BILL No. 3: COMMON AREAS & BASEMET**

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>A.</b>	<b>SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING:- <u>LIGHTING POINTS AND SWITCHES</u></b>				
3.01	Lighting points wired in 3 x 1.5mm <sup>2</sup> PVC/SC CU cables drawn in 20mmØ surface mounted HG/PVC conduits complete with all necessary accessories but excluding switches for:- i) One way switching ii) Two way switching	18 60	No. No.		
3.02	10A, moulded plastic ivory white switch plates as MK or approved equivalent as follows:- i) One gang one way ii) Two gang two way	15 12	No. No.		
3.03	Lighting fittings complete with lamps of appropriate wattage and colour rendering and fixing materials as follows:- i) 36W, 3600lm 600X600 LED fitting as Philips Smartbright LED panel or approved equivalent for lift lobbies  ii) Emergency circular /square surface luminaire with opal diffuser and white polycarbonate body for non-maintained emergency lighting for 3 hour duration as Philips or Approved Equivalent for lift lobbies  iii) Shallow surface luminaire with circular opal diffuser and white stand-off ring, with integral HPF control gear for 20W 2D compact LED lamp. As Philips Ceiling Light LED "Canopus" Round 20W 2000Lm White 2700K IP44 or Approved Equivalent  iv) 1200mm, IP66, 2x25W LED, Weather proof light fittings as Philips LED Smartbright or approved equivalent for baement.	12  6  60  30	No.  No.  No.  No.		
<b>Total carried to Bill No 3 Collection Page</b>					

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>B.</b>	<b>POWER POINTS</b>				
3.04	Undersink water heater power points comprising wiring in 3 x 4mm <sup>2</sup> PVC/SC/CU cables drawn in 25mmØ HG/PVC conduits complete with all necessary accessories	6	No.		
3.05	20A, DP control switch with neon light and cord outlet for item above as MK or approved equivalent	6	No.		
3.06	Toilet extract power points comprising wiring in 3 x 2.5mm <sup>2</sup> PVC/SC/CU cables drawn in 25mmØ concealed HG PVC conduits	6	No.		
3.07	20A, DP control switch with neon light and cord outlet for item above as MK or approved equivalent	6	No.		
<b>Total carried to Bill No 3 Collection Page</b>					

**BILL No. 3 COLLECTION PAGE**

<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
1	TOTAL B/F Page F/8.....	
2	TOTAL B/F Page F/9 .....	
<b>Total for Bill No. 3: C/F to Bills Summary Page</b>		

**BILL No. 4: 8TH FLOOR**

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>A.</b>	<b>SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING:- <u>LIGHTING POINTS AND SWITCHES</u></b>				
4.01	Lighting points wired in 3 x 1.5mm <sup>2</sup> PVC/SC CU cables drawn in 20mmØ surface mounted HG/PVC conduits complete with all necessary accessories but excluding switches for:- i) One way switching ii) Two way switching	56 12	No. No.		
4.02	10A, moulded plastic ivory white switch plates as MK or approved equivalent as follows:- i) One gang one way ii) One gang two way iii) Intermediate Switch	17 12 3	No. No. No.		
4.03	Lighting fittings complete with lamps of appropriate wattage and colour rendering and fixing materials as follows:- i) 36W, 3600lm 600X600 LED fitting as Philips Smartbright LED panel or approved equivalent ii) 1200mm, 1x25W LED, bare batten light fittings complete with lampshade as Philips LED or approved equivalent.	58 8	No. No.		
4.04	8W Self-contained two sided EXIT sign for non-maintained emergency lighting for 3 hour duration as Thorn EF X3 or approved equivalent.	2	No.		
<b>Total carried to Bill No 4 Collection Page</b>					

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>B. POWER POINTS</b> 4.05	Raw power socket outlet power points comprising wiring in 3 x 2.5mm <sup>2</sup> PVC/SC CU cables drawn in 25mmØ concealed HG PVC conduits/trunking including all conduit accessories but excluding plates to replace any damaged one <b>(Only Provisional)</b>	20	No.		
4.06	13A moulded switched socket outlet plates as MK or approved equivalent as follows: i) Twin switched <b>(Only Provisional)</b>	20	No.		
<b>Total carried to Bill No 4 Collection Page</b>					

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>C.</b>	<b><u>POWER DISTRIBUTION</u></b> <b>Supply, Install, Test and Commission the following</b> <b>Distribution Boards as havel or approved equivalent</b> <b><u>RAW POWER DISTRIBUTION BOARDS</u></b>				
4.07	125A, 12-Way, TPN <b>Raw Power DB</b> surface/flush mounted as EATON or approved equivalent	2	No.		
4.08	SP Miniature circuit breakers for the distribution boards above				
	i) 10A SP MCB	5	No.		
	ii) 20A SP MCB	6	No.		
	iii) 32A SP MCB	4	No.		
	iv) 45A SP MCB	1	No.		
	v) 63A TP MCB	5	No.		
<b>D.</b>	<b><u>SUB-MAINS &amp; FEEDER CABLES</u></b>				
4.09	25 mm <sup>2</sup> 4-C PVC/SWA/PVC copper cable to DB above c/w appropriate cable lugs for raw power	100	Lm		
	i) Cable glands for above cable	4	No.		
4.10	150x75mm, 14SWG cable tray c/w mounting row bolts and all other necessary accessories	50	Lm		
4.11	300x300x75mm recessed galvanised sheet steel draw boxes compete with powder coated cover and all other necessary accessories	8	No.		
4.12	150 X 50mm - 2 compartment, gauge 16 sheet Deep Powder coated metal trunking complete with bends, outlet plates and other necessary accessories As Manufactured by Power Technics	500	LM		
4.13	Allow for labelling the distribution boards under this section including all the incoming and outgoing circuits as per the specifications	1	Item		
<b>Total carried to Bill No 4 Collection Page</b>					

**BILL No. 4 COLLECTION PAGE**

<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
1	TOTAL B/F Page F/11.....	
2	TOTAL B/F Page F/12 .....	
3	TOTAL B/F Page F/13.....	
<b>Total for Bill No. 4: C/F to Bills Summary Page</b>		

**BILL No. 5: 9TH FLOOR**

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>A.</b>	<b>SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING:- <u>LIGHTING POINTS AND SWITCHES</u></b>				
5.01	Lighting points wired in 3 x 1.5mm <sup>2</sup> PVC/SC CU cables drawn in 20mmØ surface mounted HG/PVC conduits complete with all necessary accessories but excluding switches for:- i) One way switching ii) Two way switching	50 14	No. No.		
5.02	10A, moulded plastic ivory white switch plates as MK or approved equivalent as follows:- i) One gang one way ii) One gang two way iii) Intermediate Switch	13 12 4	No. No. No.		
5.03	Lighting fittings complete with lamps of appropriate wattage and colour rendering and fixing materials as follows:- i) 36W, 3600lm 600X600 LED fitting as Philips Smartbright LED panel or approved equivalent ii) 1200mm, 1x25W LED, bare batten light fittings complete with lampshade as Philips LED or approved equivalent.	54 8	No. No.		
5.04	8W Self-contained two sided EXIT sign for non-maintained emergency lighting for 3 hour duration as Thorn EF X3 or approved equivalent.	2	No.		
<b>Total carried to Bill No 5 Collection Page</b>					



Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>C.</b>	<b>POWER DISTRIBUTION</b> <b>Supply, Install, Test and Commission the following</b> <b>Distribution Boards as havel or approved equivalent</b> <b><u>RAW POWER DISTRIBUTION BOARDS</u></b>				
5.07	125A, 12-Way, TPN <b>Raw Power DB</b> surface/flush mounted as EATON or approved equivalent	2	No.		
5.08	SP Miniature circuit breakers for the distribution boards above				
	i) 10A SP MCB	5	No.		
	ii) 20A SP MCB	4	No.		
	iii) 32A SP MCB	4	No.		
	iv) 45A SP MCB	1	No.		
	v) 63A TP MCB	5	No.		
<b>D.</b>	<b>SUB-MAINS &amp; FEEDER CABLES</b>				
5.09	25 mm <sup>2</sup> 4-C PVC/SWA/PVC copper cable to DB above c/w appropriate cable lugs for raw power	100	Lm		
	i) Cable glands for above cable	4	No.		
5.10	150x75mm, 14SWG cable tray c/w mounting row bolts and all other necessary accessories	50	Lm		
5.11	300x300x75mm recessed galvanised sheet steel draw boxes compete with powder coated cover and all other necessary accessories	8	No.		
5.12	Allow for labelling the distribution boards under this section including all the incoming and outgoing circuits as per the specifications	1	Item		
<b>Total carried to Bill No 5 Collection Page</b>					

**BILL No. 5 COLLECTION PAGE**

<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
1	TOTAL B/F Page F/15.....	
2	TOTAL B/F Page F/16 .....	
3	TOTAL B/F Page F/17 .....	
<b>Total for Bill No. 5: C/F to Bills Summary Page</b>		

**BILL No. 6: 10TH FLOOR**

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>A.</b>	<b>SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING:- <u>LIGHTING POINTS AND SWITCHES</u></b>				
6.01	Lighting points wired in 3 x 1.5mm <sup>2</sup> PVC/SC CU cables drawn in 20mmØ surface mounted HG/PVC conduits complete with all necessary accessories but excluding switches for:-				
	i) One way switching	40	No.		
	ii) Two way switching	8	No.		
6.02	10A, moulded plastic ivory white switch plates as MK or approved equivalent as follows:-				
	i) One gang one way	6	No.		
	ii) One gang two way	14	No.		
	iii) Intermediate Switch	3	No.		
6.03	Lighting fittings complete with lamps of appropriate wattage and colour rendering and fixing materials as follows:-				
	i) 36W, 3600lm 600X600 LED fitting as Philips Smartbright LED panel or approved equivalent	45	No.		
	ii) 1200mm, 1x25W LED, bare batten light fittings complete with lampshade as Philips LED or approved equivalent.	3	No.		
6.04	8W Self-contained two sided EXIT sign for non-maintained emergency lighting for 3 hour duration as Thorn EF X3 or approved equivalent.	2	No.		
<b>Total carried to Bill No 6 Collection Page</b>					

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>B.</b>	<b>POWER POINTS</b>				
6.05	Raw power socket outlet power points comprising wiring in 3 x 2.5mm <sup>2</sup> PVC/SC CU cables drawn in 25mmØ concealed HG PVC conduits/trunking including all conduit accessories but excluding plates to replace any damaged one <b>(Only Provisional)</b>	20	No.		
6.06	13A moulded switched socket outlet plates as MK or approved equivalent as follows: i) Twin switched <b>(Only Provisional)</b>	20	No.		
6.07	Three Phase for 1No. ground water tank pump power points wired with 10mm sq. 4-C PVC/SWA/PVC copper cable in 50 mm diam. HG PVC conduits	150	LM.		
6.08	63A, TP control/rotary switch with neon light and cord outlet for item above as Crabtree or approved equivalent	1	No.		
6.09	63A, 5 pin plug for item above as Crabtree or approved equivalent	1	No.		
<b>Total carried to Bill No 6 Collection Page</b>					

Item	Description	Qty	Unit	Rate Kshs	Cost Kshs
<b>C.</b>	<b>POWER DISTRIBUTION</b> <b>Supply, Install, Test and Commission the following</b> <b>Distribution Boards as havel or approved equivalent</b> <b><u>RAW POWER DISTRIBUTION BOARDS</u></b>				
6.10	125A, 12-Way, TPN <b>Raw Power DB</b> surface/flush mounted as EATON or approved equivalent	2	No.		
6.11	SP Miniature circuit breakers for the distribution boards above				
	i) 10A SP MCB	5	No.		
	ii) 20A SP MCB	6	No.		
	iii) 32A SP MCB	4	No.		
	iv) 45A SP MCB	1	No.		
	v) 63A TP MCB	5	No.		
<b>D.</b>	<b>SUB-MAINS &amp; FEEDER CABLES</b>				
6.12	25 mm <sup>2</sup> 4-C PVC/SWA/PVC copper cable to DB above c/w appropriate cable lugs for raw power	100	Lm		
	i) Cable glands for above cable	4	No.		
6.13	150x75mm, 14SWG cable tray c/w mounting row bolts and all other necessary accessories	50	Lm		
6.14	300x300x75mm recessed galvanised sheet steel draw boxes compete with powder coated cover and all other necessary accessories	8	No.		
6.15	Allow for labelling the distribution boards under this section including all the incoming and outgoing circuits as per the specifications	1	Item		
<b>Total carried to Bill No 6 Collection Page</b>					

**BILL No. 6 COLLECTION PAGE**

<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
1	TOTAL B/F Page F/19.....	
2	TOTAL B/F Page F/20 .....	
3	TOTAL B/F Page F/21 .....	
<b>Total for Bill No. 6: C/F to Bills Summary Page</b>		

**BILL No. 7: AUDIO VISUAL SYSTEM INSTALLATIONS FOR BOARDROOM AND COMMITTEE ROOM**

Item	Description	Qty	Unit	Rate	Kshs.
	<p><b>Supply, Install, Test, integration and Commission the following:</b></p>				
7.00	<p>Web Conferencing Camera complete with Surface Mount Accessories as Logitech BCC950 or approved equivalent and as described in the Particular Specifications.</p>	1	No.		
7.01	<p>2 Input 300 W Output Channel Rack Mountable Amplifier with built in Power Supply and Complete with Transformer Kit for Hi-Z Application as JBL or approved equivalent.</p>	1	No.		
7.02	<p>6.5", 8 Ohm, Two Way, 60W Ceiling Speakers as JBL 47HC or approved equivalent.</p>	4	No.		
7.03	<p>8 Input, 2 Output Channel Rack Mountable Digital Audio Mixer with built in Power Supply as JBL or approved equivalent.</p>	1	No.		
7.04	<p>Digital Conference System as follows:                      i) Chairman Microphone Station as described in the Particular Specifications.                      ii) Delegate gooseneck Microphone Station as described in the Particular                      iii) Base Unit as described in the Particular Specifications.</p>	1	No.		
		8	No.		
		1	No.		
	<p><b>Total C/F to Next page</b></p>				

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
	<b>Sub- Total B/F From Previous Page</b>				
7.05	Provide for the integration of the sound system and the display system	1	Item		
7.06	2U vertical cable managers/organizers and as Siemon or approved equivalent	3	No.		
7.07	75" LED full HD interactive display screen as described in technical specifications of this document complete with all necessary accessories as Barco Unisee or approved equivalent described in technical specifications.	1	No.		
7.08	8", 8 Ohm, 80W Ceiling Subwoofer with Built In Crossover as JBL 40CS/T or approved equivalent.	2	No.		
7.09	Floor/meeting table box complete with the following parameters; a) 1No. HDMI output b), 1No. VGA output, c)1No. Auxilliary sound cable integrated to VGA d)1No. Clean power twin socket, e)1No. RJ45 port	4	No.		
7.10	24 Port Patch panel as Siemon or approved equivalent.	1	No.		
7.11	12U wall mounted cabinet as described in the particular specification	8	No.		
7.12	Screened Armoured 8 Core Multimode Fibre Optic Cable as Siemon or approved equivalent from the Access Switches to the Core Switch.	20	LM		
<b>Total C/F to Next page</b>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
	<b>Sub- Total B/F From Previous Page</b>				
	<b>COMMITTEE ROOM AUDIO VISUAL SYSTEM</b>				
7.14	Web Conferencing Camera complete with Surface Mount Accessories as Logitech BCC950 or approved equivalent and as described in the Particular Specifications.	1	No.		
7.15	2 Input 300 W Output Channel Rack Mountable Amplifier with built in Power Supply and Complete with Transformer Kit for Hi-Z Application as JBL or approved equivalent.	1	No.		
7.16	6.5", 8 Ohm, Two Way, 60W Ceiling Speakers as JBL 47HC or approved equivalent.	4	No.		
7.17	8 Input, 2 Output Channel Rack Mountable Digital Audio Mixer with built in Power Supply as JBL or approved equivalent.	1	No.		
7.18	Digital Conference System as follows: i) Chairman Microphone Station as described in the Particular Specifications. ii) Delegate gooseneck Microphone Station as described in the Particular Specifications. iii) Base Unit as described in the Particular Specifications.	1 8 1	No. No. No.		
7.19	Provide for the integration of the sound system and the display system	1	Item		
7.20	2U vertical cable managers/organizers and as Siemon or approved equivalent	3	No.		
	<b>Total C/F to Next page</b>				

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
	<b>Sub- Total B/F From Previous Page</b>				
7.21	75" LED full HD display screen as described in technical specifications of this document complete with all necessary accessories as Barco Unisee or approved equivalent described in technical specifications.	1	No.		
7.22	8", 8 Ohm, 80W Ceiling Subwoofer with Built In Crossover as JBL 40CS/T or approved equivalent.	2	No.		
7.23	Floor/meeting table box complete with the following parameters; a) 1No. HDMI output b), 1No. VGA output, c)1No. Auxilliary sound cable integrated to VGA d)1No. Clean power twin socket, e)1No. RJ45 port	4	No.		
7.24	24 Port Patch panel as Siemon or approved equivalent.	1	No.		
7.25	12U wall mounted cabinet as described in the particular specification	8	No.		
7.26	Screened Armoured 8 Core Multimode Fibre Optic Cable as Siemon or approved equivalent from the Access Switches to the Core Switch.	20	LM		
<b>Total for Bill No. 7 C/F to Bills Summary page</b>					

**BILL No. 8: IP CCTV SYSTEM**

Item	Description	Qty	Unit	Rate Kshs	Amonnt Kshs.
	<p><b>Supply, Install, Test, integration and Commission the following:</b></p>				
8.01	<p>Indoor, IP POE, Vandal resistant Bullet camera as described in the technical specifications of this document and complete with housing, appropriate mounting brackets and all other accessories to engineers approval as Wisenet or approved equivalent</p>	20	No.		
8.02	<p>As "detto" but Dome camera</p>	15	No.		
8.03	<p>Category 6A, 48 Port Patch Panel and as Siemon or approved equivalent.</p>	1	No		
8.04	<p>1M RJ45-RJ45 Cat 6A UTP factory terminated patch cord as Siemons or approved equivalent to be used at work station as Siemon or approved equivalent.</p>	70	No		
8.05	<p>Cat 6A UTP 4-pair cable as Siemons or approved equivalent</p>	7000	M		
8.06	<p>24 Port Managed Gigabit Ethernet Switch with 10/100 MBPS PoE plus (at least 480W) and 2 SFP Ports as CISCO catalyst 9200 switch (<i>currently available in the market and being supported by Cisco</i> ) or approved equivalent</p>	1	No.		
<b>SUB-TOTAL CARRIED TO NEXT PAGE</b>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
	<b>Sub- Total B/F From Previous Page</b>				
8.07	64 Channels IP Network video recorder with PoE complete with minimum recording speed of 256mbps, minimum recording HDD 32TB, video management software, redundant power supply and all other accessories and as described in the particular specifications as Hikvision or approved equivalent	1	No.		
8.08	Operator workstation hardware/Desktop computer complete with software as described in particular specifications complete with necessary accessories	1	Item		
8.09	65" LED full HD display screen as described in technical specifications of this document complete with all necessary accessories as LG or approved equivalent	1	No.		
8.10	2U vertical cable managers/organizers and as Siemon or approved equivalent	6	No.		
8.11	Digital universal key board complete with joystick and LCD screen	1	No.		
8.12	Outdoor 8 core single mode fiber cable complete with all accessories for backbone cabling to the server room	80	M		
<b>SUB-TOTAL CARRIED TO NEXT PAGE</b>					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
	<b>Sub- Total B/F From Previous Page</b>				
8.13	Backbone cabling				
	a) Fibre optic patch panel & leads	1	Item		
	b) DTU	1	No.		
	c) SFP fibre modules as CISCO or approved equivalent	2	No		
	d) 10G fibre to UTP media converter with PoE	1	No		
8.14	2KVA Rack Mountable UPS as Eaton or approved equivalent				
8.15	Provide telecommunication earth including fuses lighting arrestors and frame earthing to engineers approval	1	Item		
8.16	45A High voltage surge protector as Sollateck or approved equivalent	1	No.		
8.17	12U wall mounted cabinet as described in the particular specification	2	No.		
8.18	Allow for providing working drawings before onset of the installation of the CCTV system (3 sets)	1	Item		
8.19	Allow for providing operation & maintainance manuals and "as built" drawings after complete installation of the CCTV system (5 sets)	1	Item		
8.20	Allow for checking the status of the entire and maintaining the existing IP CCTV system in the building to ensure operation	1	Item		
8.21	Any other items necessary to complete the above installation as per the system you propose to install. Please list the items, price and include in your totals	1	Lot		
	a)				
	b)				
	c)				
	d)				
<b>Total for BILL No. 8 C/F to IP CCTV Bills Summary Page</b>					

**BILLS SUMMARY PAGE**

<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
A	Sub-total for Bill No. 2 C/F from Page F/7 - GROUND FLOOR	
B	Sub-total for Bill No. 3 C/F from Page F/10 - BASEMENT AND COMMON AREAS	
C	Sub-total for Bill No. 4 C/F from Page F/14 - 8TH FLOOR	
D	Sub-total for Bill No. 5 C/F from Page F/18 - 9TH FLOOR	
E	Sub-total for Bill No. 6 C/F from Page F/22 - 10TH FLOOR	
F	Sub-total for Bill No. 7 C/F from Page F/25 - BOARDROOM AUDIO-VISUAL SYSTEM	
F	Sub-total for Bill No. 8 C/F from Page F/28 - CCTV SURVEILLANCE INSTALLATION WORKS	
	Total C/F to Electrical Engineering Works Summary Page	

**ELECTRICAL ENGINEERING WORKS SUMMARY PAGE**

<b>Item</b>	<b>Description</b>	<b>Cost Kshs</b>
<b>A</b>	PRELIMINARIES AND GENERAL CONDITIONS B/F FROM PAGE F/4	
<b>B</b>	SUB-TOTAL FOR ELECTRICAL WORKS B/F FROM BILLS SUMMARY PAGE F/29	
<b>C</b>	CONTINGENCY TO BE USED AT THE DISCRETION OF PROJECT ELECTRICAL ENGINEER	<b>500,000.00</b>
<b>D</b>	<b>TOTAL FOR ELECTRICAL ENGINEERING SERVICES INSTALLATION WORKS C/F TO MAIN WORKS SUMMARY PAGE</b>	

SECTION G  
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 they intend to offer to the employer as listed in the technical 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 as a Mandatory Requirement)

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>TYPE/MAKE</b>	<b>COUNTRY OF ORIGIN</b>
<b>I</b>	Lighting fittings		
2	Switches and Sockets		
3	Power Cables		
4	Distribution Board and MCBs		
5	CAT 6A Cable		
<b>6</b>	Network Switch		
7	Data Cabinet		
8	Fibre Optic Cable		
<b>9</b>	Uninterruptible Power Supply		
<b>I0</b>	Patch Panels		
<b>I1</b>	CCTV Cameras		
<b>I2</b>	Network Video Recorder (NVR)		
<b>I3</b>	75'' Interactive screen		
<b>I4</b>	Microphones		
<b>I5</b>	Speakers		

**Detailed manufacturer's Brochures** detailing Technical Literature and specifications on the above items **MUST** be attached and Items to be supplied highlighted (Model and Make).

**SECTION H**

**STANDARD FORMS**

## CONTENTS OF SECTION H

	<u>TITLE</u>	<u>PAGE</u>
1.	Contents	EIW- H/1
2.	Key Personnel	EIW- H/2
3.	Schedule of Contracts completed in the last three (3) years	EIW- H/3
4.	Schedule of on-going projects	EIW- H/4
5.	Schedule of major items of Contractor's Equipment	EIW- H/5
6.	Details of Litigation or Arbitration Proceedings	EIW- H/6
7.	Commissioning Guide for Electrical Installation works	EIW-H/7 – EIW-H/13

### NOTE:

Tenderers must duly fill these Standard Forms as a mandatory requirement as they will form part the evaluation criteria.

KEY PERSONNEL

Qualifications and experience of key personnel proposed for administration and execution of the Contract.

POSITION	NAME	HIGHEST QUALIFICATION (Attach proof)	YEARS OF EXPERIENCE (GENERAL)	YEARS OF EXPERIENCE IN PROPOSED POSITION

I certify that the above information is correct.

.....  
Title

.....  
Signature

.....  
Date

CONTRACTS COMPLETED IN THE LAST FIVE (5) YEARS

Work performed on works of a similar nature, complexity and volume over the last 5 years.

PROJECT NAME	NAME OF CLIENT	TYPE OF WORK AND YEAR OF COMPLETION	VALUE OF CONTRACT (Kshs.)

I certify that the above works were successfully carried out and completed by ourselves.

.....

.....

.....

Title

Signature

Date

SCHEDULE OF ON-GOING PROJECTS

Details of on-going or committed projects, including expected completion date.

PROJECT NAME	NAME OF CLIENT	CONTRACT SUM	% COMPLETE	COMPLETION DATE

I certify that the above works are currently being carried out by ourselves.

.....

Title

.....

Signature

.....

Date

SCHEDULE OF MAJOR ITEMS OF CONTRACTOR'S EQUIPMENT PROPOSED FOR CARRYING OUT THE WORKS (Attach proof of ownership)

ITEM OF EQUIPMENT	DESCRIPTION, MAKE AND AGE (Years)	CONDITION (New, good, poor) and number available	OWNED, LEASED (From whom?), or to be purchased (From whom?)

DETAILS OF LITIGATION OR ARBITRATION PROCEEDINGS IN WHICH THE TENDERER HAS BEEN INVOLVED AS ONE OF THE PARTIES IN THE LAST 5 YEARS

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_



REPUBLIC OF KENYA

MINISTRY OF LANDS, PUBLIC WORKS, HOUSING & URBAN  
DEVELOPMENT

STATE DEPARTMENT FOR PUBLIC WORKS

(ELECTRICAL DEPARTMENT)

TESTING & COMMISSIONING GUIDE  
FOR  
ELECTRICAL INSTALLATION WORKS ON SITE

Issued by:

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NAIROBI.

MINISTRY OF LANDS, PUBLIC WORKS HOUSING & URBAN DEVELOPMENT

STATE DEPARTMENT FOR PUBLIC WORKS  
ELECTRICAL DEPARTMENT

TESTING AND COMMISSIONING OF ELECTRICAL INSTALLATION WORKS ON SITE.

PROJECT NAME: .....

W.P. NO. .... JOB NO.....

PROJECT SITE.....

CLIENT.....

The Sub contractor shall test in accordance with the relevant section of IEE regulations, Rule 3 of the Electrical Power Act for additional tests not covered by the regulations, Government Electrical specifications I & II and the Kenya Power & Lighting Co. Ltd by-laws.

A PRELIMINARY CHECKS

The Engineer shall check to establish the following data:-

ITEM	DESCRIPTION	REMARKS
(i)	Type of installation (New/Renovation/Addition/ to existing installation)	
(ii)	a) Power supply 240V/415V/11KV	.....
	b) Frequency of the mains supply	.....
	c) Installation power factor	.....
(iii)	Method of Metering (New /Monitoring/Existing meter)	
(iv)	Are Testing/Measuring instruments available	
(v)	Are there maintenance/operational manuals for specialized systems (if any)	
(vi)	List of 'As installed drawings'	
	Drg No.	Description

**B TESTS**

ITEM	TEST DESCRIPTION	OBSERVATIONS/ RESULTS	REMARKS
1	Tests shall be carried out to ensure:		
	a) All fuses and single pole switches are installed in live conductor		
	b) All outlets and switched socket outlets are connected to 'LIVE' conductor in the Terminal marked so and each earth pin effectively bonded to earth continuity system		
	c) Verify continuity of all final conductors of each 'Ring' circuit. (0.05 to 0.8Ω)	.....Ohms	
	d) All radial circuits emanate from respective distribution boards/consumer units and that they do not supply any other Equipment		
	e) The correct phase sequence is maintained throughout the installation		
	f) Effective 'Discrimination' in the arrangement of protective devices. i.e. a fault in the furthest power point/Lighting point should not blow or trip Fuses/MCBs respective in the Meter board.		
2	Inspect to ensure:		
	a) No terminal in the Ceiling Rose is 'LIVE' when the corresponding switch is in the off position.		
	b) All conduit termination conduit boxes, Consumer unit, DB's and Adaptable boxes have smooth edges and are properly bushed.		
	c) All fixed metal works close to Electrical installation are bonded to earth continuity conductor.		
	d) All Fuse ways and Circuit breakers for final sub circuits are properly labeled		

B TESTS CONT'D

ITEM	TEST DESCRIPTION	OBSERVATIONS/ RESULTS	REMARKS
3	Carry out the following tests:		
	a) Insulation Resistance tests <ul style="list-style-type: none"> <li>i) Between phases                             <ul style="list-style-type: none"> <li>a) R -Y .....MΩ</li> <li>b) R -B .....MΩ</li> <li>c) B-Y .....MΩ</li> </ul> </li> <li>ii) Phase to Neutral                             <ul style="list-style-type: none"> <li>a) R - N .....MΩ</li> <li>b) Y - N .....MΩ</li> <li>c) B - N .....MΩ</li> </ul> </li> <li>iii) Phase to Earth                             <ul style="list-style-type: none"> <li>a) R - E .....MΩ</li> <li>b) Y -E .....MΩ</li> <li>c) B -E .....MΩ</li> </ul> </li> </ul>		
	Minimum thresholds for above and for: <ul style="list-style-type: none"> <li>i) ELV circuits (SELV &amp; PELV) = 0.25 MΩ</li> <li>ii) LV Circuits up to 500V = 0.5 MΩ</li> <li>iii) LV Circuits above 500V = 1 MΩ</li> </ul>		
	b) Earth continuity conductor impedance (0.005 to 2Ω)	.....Ohms	
	c) Earth fault Loop impedance (0 - 2000 Ω)	.....Ohms	
	d) Earth Electrode resistance (Less than 4Ω)	.....Ohms	
	e) Earth Lead resistance (Less than 4Ω)	.....Ohms	
	f) The operation of protection MCCBS & MCBS (Tripping under faulty conditions)		
	g) Check the mechanical toggling (make & break) of all the switches to installed accessories.		
	4	Underground cabling, Check for:	
i) Continuity of the phases			
ii) Factory tests done (avail certification)			
iii) Proper termination			
iv) Route markers			

B TESTS CONT'D

ITEM	TEST DESCRIPTION	OBSERVATIONS/ RESULTS	REMARKS	
5	Installed load			
	i) Lighting points (No.)			
	ii) Socket outlets (No.)			
	iii) Motors (Give rating)			
	iv) Other machines (Attach list if more)			
	Item	Description	Rating	
6	Type of Earthing: TN-C/TN-S/ TN-C-S/TT/IT.			
7	LV switchboard: The board shall be checked to ascertain the following			
	i) Rating of the switchboard			
	ii) Rating of main incomer MCCB			
	iii) Form of construction (1/2B/3B/4)			
	iv) Degree of protection (IP rating)			
	v) Nameplates for identification of all circuits entering/leaving switchgear			
	vi) Proper Electrical & Mechanical operation of functional parts i.e MCCBs, Indicating meters, CTs & VTs .			
	vii) Check cable terminations, type & terminals			
	viii) General comments on the appearance of the finished mechanical assembly including welding, full nuts & tightness of bolted parts.			
8	Fireman's switch.			
	i) Make and manufacturer			
	ii) The rating of the switch			
	iii) Test for the Electrical and Mechanical operation of the switch			
	iv) State the types of loads supported by the maintained board on the switch.			
	** see foot note			



**STATEMENT OF COMPLIANCE**

- (a) I confirm compliance with all clauses in this tender specification.
- (b) I confirm that I have not and will not make any payment to any person which can be perceived as in inducement to enable me win this tender.

Signed .....for and on behalf of the Tenderer.

Date .....

**SECTION E**

**SCHEDULE OF UNIT RATES**

## SCHEDULE OF UNIT RATES

1. The tenderer shall insert unit rates against the items in the following schedules and may add such other items as he considers appropriate.
2. The unit rates shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation under this contract.
3. The unit rates will be used to assess the value of additions or omissions arising from authorised variations to the contract works.
4. Where trade names or manufacturer's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of article or quality of material required. Alternative brands of equal and approved quality will be accepted.
5. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including V.A.T, Withholding tax and all other taxes applicable at the time of tender).
6. Any bid returned with unfilled Schedule of Unit Rates shall be considered technically non- responsive, and the bidder shall automatically be disqualified.

SCHEDULE OF UNIT RATES  
(MUST be completed by the Tenderer)

NO	DESCRIPTION	QTY	UNIT	UNIT RATE
				KSHS
1	<b>Cables:</b> a) <b>Single Core PVC Cables</b> i) 10mm <sup>2</sup>	1	Lm.	
	ii) 25mm <sup>2</sup>	1	Lm.	
2	<b>PVC/SWA/PVC Armoured Copper cables per meter</b> a) 10.0mm sq. 2 core	1	Lm.	
	b) 16.0 mm sq 4 core	1	Lm.	
3	<b>Consumer Units and Distribution Boards as Schneider Electric or an approved equivalent;</b> a) 18 Way SPN with integral 100A Isolating Switch	1	No.	
	b) 10 Way TPN with integral 100A Isolating Switch	1	No.	
	c) 10 Way SPN with integral 100A Isolating Switch	1	No.	
	d) 8 Way TPN with integral 100A Isolating Switch	1	No.	
4	<b>Miniature Circuit Breakers</b> a) 6A	1	No.	
	b) 50A	1	No.	
	c) 80A			
5	<b>10A moulded ivory switch plates as MK, Clipsal, BG, Crabtree or approved equivalent as follows:</b> a) 2 gang 1 way	1	No.	
	b) 3 gang 2 way	1	No.	
6	<b>HG PVC Conduits</b> a) 32mm	1	No	
	b) 50mm	1	No	
7	<b>Cable Trunking</b> Two compartment trunking manufactured in 14 SWG steel sheet and finished in cream powder coating with the following dims; a) 50x25mm	1	Lm.	
	b) 100x50mm	1	Lm.	
	c) 200x50mm	1	Lm.	

Item	Description	Unit	Qty	Rate (Kshs)
1.	48 port edge switch POE capabilities	No.	1	
2.	Single port Cat 6A angled Faceplate	No	1	
3.	5KVA single phase UPS	No	1	
4.	9U Wall Mounted cabinet	No.	1	
5.	12 port CAT6A data patch panel	No.	1	
6.	CAT6A SFTP Cable as Siemon	No.	1	
7.	12 Port Fibre Patch Panel	No.	1	
8.	CAT 6E UTP 4-Pair Cable	No.	1	
9.	6 core Single mode fiber cable	No.	1	
10.	Heavy duty electric strikes	No.	1	
11	64 Port Network Video Recorder	No.	1	
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**PROVISIONAL SUMS**

**PROPOSED RENOVATIONS AT COFFEE PLAZA- NAIROBI**

ITEM	DESCRIPTION	QTY	UNIT	RATE (KSHS)	AMOUNT (KSHS)
	<b><u>PROVISIONAL SUMS</u></b>				
A	Allow a provisional sum of Kshs Three Million (KShs. 3,000,000.00) only for Contigencies.		ITEM		3,000,000.00
B	Allow a provisional sum of Kshs Eight Hundred Thousand (KShs. 800,000.00) only for branding.		ITEM		800,000.00
	<b>Total for PC Sums &amp; Provisional Sums carried to Grand Summary</b>			<b>KSHS</b>	<b>3,800,000.00</b>

## GRAND SUMMARY

**PROPOSED RENOVATIONS AT COFFEE PLAZA, NAIROBI**

GRAND SUMMARY

ITEM	DESCRIPTION		OFFICIAL USE (KSHS)	FOR CONTRACTOR'S USE
1	PARTICULAR PRELIMINARIES	PP/8		
2	GENERAL PRELIMINARIES	GP/15		
3	BUILDERS' WORK	BW		
4	ELECTRICAL WORKS	PS/1		
5	MECHANICAL WORKS	BW		
6	PROVISIONAL SUMS	PS/1		
	TOTAL CARRIED TO FORM OF TENDER ( VAT INCL.) KSHS.			

Amount in words: Kenya Shilings.....

.....

Tenderer's signature and stamp.....

Address.....

Date.....

Witness: Name and signature.....

Address.....

Date.....

G/S