PART IV- BILLS OF QUANTITIES

AUDITORIUM WORKS

DAIS RENOVATION WORKS- LOT 1					
ITEM	**DESCRIPTION**	**QTY**	**UNIT**	**RATE**	**AMOUNT**
	ELEMENT NO. 1: DEMOLITION WORKS Pricing Notes *Rates provided for the following works shall, in addition to what is described in the particular item, include:* *Clearing debris with speed on daily basis as they arise, clearing affected surfaces and removal of debris from site to approved dumping site. Accumulation of debris within the site shall not be allowed.* *Rates given shall in addition to the particular item described, allow for the disconnection of pipework (water and drainage), plugging pipes and removal of any surface pipes and fittings.* *Rates given shall in addition to the particular item described, allow for the disconnection of cables, conduits (electrical) and the removal of any surface conduits and fittings.* *All work shall be carefully executed with the particular aim of preserving the items being removed and minimizing damage to adjacent finishes, structures and components.* *Rates quoted for removing components shall be deemed to be inclusive of clearing, handling, storage on site and disposal as directed.* *Rates quoted should include for the temporary support to adjacent areas while carrying out demolition work.*				
	Total Carried to Cllection				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	DOORS				
A	Carefully remove old and dysfunctional wooden door, overall size 900 x 2700mm high (1 No.)		ITEM		
B	Carefully remove old and dysfunctional aluminum sliding door, overall size 2400 x 2400mm high (2 No.)		ITEM		
	CEILING				
C	Carefully removed deformed T&G wood ceiling and cart away debris as directed (approximately 154 SM)		ITEM		
	WALLS				
D	Carefully remove old wall paper and cart away debris as directed (approximately 300 SM)		ITEM		
E	Carefully remove old deform chipboard wall cladding and cart away debris as directed (approximately 500 SM)		ITEM		
	CARPET				
F	Carefully remove old and torn floor carpet and store as directed (approximately 2500 SM)		ITEM		
	DAIS (PLATFORM)				
G	Carefully remove existing stage materials including cover material, deck, loose cables and store as directed (approximately 6 x 10 x 900mm high)		ITEM		
	Total Carried to Summary				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	ELEMENT NO.: AUDITORIUM DAIS				
	Dais/Stage				
	Reinforced concrete slab covered with approved moisture barrier with acoustic rubber isolation pads and 18 mm marine plywood layer with 50mm thick hardwood finish layer finished with polyurethane protective coat				
A	150mm thick reinforced concrete slab including 1200mm high sides and partitions with 10mm diameter bars spaced as per the S.E details	550	SM		
B	1200-gauge DPM/ virgin polythene moisture barrier	550	SM		
C	100 x 100 x 25mm thick acoustic isolation pads placed under every timber batten intersection.	180	NO		
D	75 x 50mm timber battens spaced 300 x 300 mm centers	550	SM		
E	18mm thick marine board plywood	550	SM		
F	20mm thick mahogany finish layer	550	SM		
G	20mm thick mahogany finish layer	550	SM		
H	Prepare and apply 3 coats of polyurethane clear varnish	550	SM		
	Carpet				
N	500 x 500 x 15mm thick carpet tile with approved modula format and acoustic insulation.	750	SM		
	Prepare and apply one undercoat and three coats of first quality emulsion Vinyl Matt paint to the following surfaces				
O	Walls; internal	2,100	SM		
	Total Carried to Summary				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	ELEMENT NO.5: MANAGEMENT OFFICES				
	DOORS				
	The following in mahogany or other equal and approved well-seasoned HARDWOOD				
A	45mm thick double swing solid core door comprising of six panels with in mahogany overall size 1200 x 700mm high	6	No.		
	Flush doors to BS 459(part 2)				
B	45 mm single lead semi-solid panel core flush door faced both sides with 6mm mahogany veneered and hardwood lipped all round, overall size 900 x 2700mm.	4	No.		
	Prepare surfaces by sanding, adjust and align door frames and finishing in accordance to the architect's speciation's.				
C	Frame to detail size, 200 x 50mm, with two labours *Knot, prime and stop; prepare and apply one coat stain and two coats of clear varnish*	80	LM		
D	General surfaces of wood **supply and fix the following iron mongery with matching screws to timber doors as per''UNION''unless otherwise stated**	81	SM		
E	Heavy duty; 125mm brass butt hinges	15	PR		
F	Cylinder high security lock	10	NO		
G	Wall mounted rubber door stop complete with rawl bolt	20	NO		
H	Slow action door closer as UNION or any equal and approved	10	NO		
	Hardwood				
J	100 x 25mm T&G ceiling *Prepare and apply one undercoat and three coats of first quality emulsion Vinyl Matt paint to the following surfaces*	50	SM		
K	Walls; internal	600	SM		
L	Concrete ceilings	400	SM		
M	*Knot, prime and stop; prepare and apply one coat stain and two coats of clear varnish* General surfaces of wood	50	SM		
	Total Carried to Summary				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	SUMMARY				
1	ELEMENT NO. 1: DEMOLITION WORKS				
2	ELEMENT NO.: AUDITORIUM DAIS				
3	ELEMENT NO.5: MANAGEMENT OFFICES				
	Total Carried to Grand Summary				

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE, NAIROBI CBD

TENDER SPECIFICATIONS AND BILL OF QUANTITIES FOR

ELECTRICAL INSTALLATION WORKS

PART 1 - TENDERING PROCEDURES

SECTION I - EVALUATION AND QUALIFICATION CRITERIA

1. General Provision

Wherever a Tenderer is required to state a monetary amount, Tenderers should indicate the

Kenya Shilling equivalent using the rate of exchange determined as follows:

a) For construction turnover or financial data required for each Year-Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year are to be converted) was originally established.

b) Value of single Contract-Exchange rate prevailing on the date of the contract signature.

c) Exchange rates shall be taken from the publicly available source identified in the

ITT. Any error in determining the exchange rates in the Tender may be corrected

by the Procuring Entity.

This section contains the criteria that the Employer shall use to evaluate tender and qualify tenderers. No other factors, methods or criteria shall be used other than specified in this tender document. The Tenderer shall provide all the information requested in the forms included in Section IV, Tendering Forms. The Procuring Entity should use the **Standard Tender Evaluation Report for Goods and Works for** evaluating Tenders.

1. Evaluation and contract award Criteria

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

2. Preliminary examination for Determination of Responsiveness

The Procuring Entity will start by examining all tenders to ensure they meet in all respects the eligibility criteria and other requirements in the ITT, and that the tender is complete *in all* aspects in meeting the requirements of *"Part 2–Procuring Entity's Services Requirements"*, including checking for tenders with unacceptable errors, abnormally low tenders, abnormally high tenders and tenders that are front loaded. The Standard Tender Evaluation Report for Goods and Works for evaluating Tenders provides clear guidelines on how to deal with review of these requirements. Tenders that do not pass the Preliminary Examination will be considered irresponsive and will not be considered further.

STAGE 2: TECHNICAL EVALUATION

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 bids 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 technically non-responsive while those meeting all technical specifications shall be considered 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.

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

ITEM	DESCRIPTION (As described in particular specification)	CONTRACTOR PROPOSED (Attach Brochures and catalogue)			Compliant/ Non-Compliant
		TYPE/MAKE	MODEL NO.	COUNTRY OF ORIGIN	
1.	**Light Fittings** (a) Type A (b) Type B (c) Type C (d) Type D (e) Type E (f) Type H (g) Type S Type B				
2.0	13A switched screwless white moulded case socket outlet plates.				
3.0	10A white screwless switch plates				
4.0	3x2.5mm sq. single core PVC insulated copper cables				
5.0	3Core 6mm sq PVC copper cables				
6.0	3x4mm sq. single core PVC copper cable				
7.0	150x50mm 2 compartment powder coated steel Trunking				
8.0	12 Ways SPN+E, flush mounted Consumer Unit complete with 100A integral isolator				
9.0	MCBs				
10.0	DP Switches				

The tenderers will be required to provide evidence in satisfying the employer of their eligibility, their capability and adequacy to effectively carry out these works.

PARTICULAR SPECIFICATIONS FOR ELECTRICAL WORKS

1.00 SITE LOCATION

The site of the proposed works is at **PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD**

2.00 SCOPE OF WORKS

The works to be carried out under this sub-contract comprise supply, installation, testing and commissioning of the following: -

(a) Electrical Works

This shall include demounting, replacement existing Lighting fittings, Lighting switches, Power socket outlets, power points, IP-CCTV Cameras and commercial visual display installation works among other works.

3.00 MATERIALS FOR THE WORKS

Materials shall be as specified in Section B 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.

4.00 BROCHURES FOR ELECTRICALEQUIPMENTAND FITTINGS

For consideration and qualification tenderers shall, at their own cost, provide coloured manufacturer's brochures detailing technical literature and highlighting specifications where applicable.

5.00 MINIMUM TECHNICAL SPECIFICATION FOR ELECTRICAL FITTINGS

a) MINIMUM TECHNICAL SPECIFICATION FOR LED LIGHT FITTINGS

- Power factor ≥ 0.85
- Operating voltage range 130-300 V ac
- Operating frequency range 45-55 Hz
- Operating hours ≥25,000 hrs
- Colour Temperature ≥ 2700K
- THD<15%

Attach technical brochures to access compliance with specification.

b) 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.

c) MCB DISTRIBUTION PANELS AND CONSUMER UNITS

All cases of MCB Panels and consumer units shall be constructed in heavy gauge sheet with hinged covers.

Removable undrilled gland plates shall be provided on the top and bottom of the cases. Miniature circuit breakers shall be enclosed in moulded plastic with the tripping mechanism and arc chambers separated and sealed from the cable terminals.

The operating dolly shall be trip free with a positive movement in both make and break position. Clear indication of the position of the handle shall be incorporated.

The tripping mechanism shall be on inverse characteristic to prevent tripping in temporary overloads and shall not be affected by normal variation in ambient temperature.

A locking plate shall be provided for each size of breaker; A complete list of circuit details on typed cartridge paper glued to stiff cardboards and covered with a sheet of Perspex, and held in position with four suitable fixings, shall be fitted to the inner face of the lids of each distribution panel. The appropriate MCB ratings shall be stated on the circuit chart against each circuit in use: Ivorine labels shall be secured to the insulation barriers in such a manner as to indicate the number of the circuits shown on the circuit chart.

Insulated barriers shall be fitted between phases, and neutrals in all boards, and to shroud live parts.

Neutral cables shall be connected to the neutral bar in the same sequence as the phase cables are connected to the MCB's. This shall also apply to earth bars when installed.

d) 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.

e) 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 conduit systems shall be arranged wherever possible to be self-draining to switch boxes and conduit outlet points for fittings:

The systems, when installed and before wiring shall be kept plugged with well-fitting plugs and when short conduit pieces are used as plugs, they shall be doubled over and tied firmly together with steel wire; before wiring all conduit, systems shall be carried out until the particular section of the conduit installation is complete in every respect.

The sets and bends in conduit runs are to be formed on site using appropriate size bending springs and all radii of bends must not be less than 2.5 times the outside diameter of the conduit. No solid or inspection bends, tees or elbows will be used.

Conduit connections shall either be by a demountable (screwed up) assembly or adhesive fixed and water tight by solution. The tube and fittings must be clean and free of all grease before applying the adhesive. When connections are made between the conduit and switch boxes, circular or non-screwed boxes, care shall be taken that no rough edges of conduit stick out into the boxes.

Runs between draw in boxes are not to have more than two right angle bends or their equivalent. The sub-contractor may be required to demonstrate to the Engineers that wiring in any particular run is easily withdrawable and the sub-contractor may, at no extra cost to the contract; be required to install additional draw-in boxes required. If conduit is installed in straight runs in excess of 6000mm, expansion couplings as manufactured by Egatube shall be used at intervals of 6000mm.

Where conduit runs are to be concealed in pillars and beams, the approval of the Structural Engineer, shall be obtained. The sub-contractor shall be responsible for marking the accurate position of all holes chases etc., on site, or if the Engineer so directs, shall provide the Main Contractor with dimensional drawings to enable him to mark out and form all holes and chases. Should the sub-contractor fail to inform the main contractor of any inaccuracies in this respect they shall be rectified at the sub-contractor's expense.

It will be the Sub-contractor's responsibility to ascertain from site, the details of reinforced concrete or structural steelwork and check from the builder's drawings the

positions of walls, structural concrete and finishes. No reinforced concrete or steelwork may be drilled without first obtaining the written permission of the Structural Engineer

The drawings provided with these specifications indicate the appropriate positions only of points and switches, and it shall be the Sub-Contractors responsibility to mark out and centre on site the accurate positions where necessary in consultation with the Architect and the Engineer. The sub-contractor alone shall be responsible for the accuracy of the final position.

f) CONDUIT BOXES AND ACCESSORIES

All conduit outlets and junction boxes are to be either malleable iron and of standard circular pattern of the appropriate type to suit saddles being used or super high impact PVC manufactured to KS 04 – 179 : 1983.

Small circular pattern boxes are to be used with conduits up to and including 25mm outside diameter. Rectangular pattern adaptable boxes are to be used for conduits of 32mm outside diameter and larger. For drawing in of cables in exposed runs of conduit, standard pattern through boxes are to be used:

Boxes are to be not less than 50mm deep and of such dimensions as will enable the largest appropriate number of cables for the conduit sizes to be drawn in without excessive bending.

Outlet boxes for lighting fittings are to be of the loop-in type where conduit installation is concealed and the sub-contractor shall allow one such box per fitting, except where fluorescent fittings are specified when two such boxes per fitting shall be fitted flush with ceiling and if necessary, fitted with break joint rings. Pattresses shall be fitted where required to outlets on surface conduit runs.

Adaptable boxes are to of PVC or mild steel (of not less than 12swg) and black enameled or galvanized 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.

g) 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

a. Reference number

b. Type of board, i.e;, lighting, sockets, etc,.
c. Size of cable supplying panel where to isolate feeder cable

(v) Shall be generally not less than 75mm x 50mm.

h) **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 armoring 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. Attention is drawn to the need for the earthing metal parts of lighting fittings and for bonding ball joint suspension in lighting fittings.

i) 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^2 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.

j) 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.

k) 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.

l) 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.

m) 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.

n) 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).

o) CABLE ENDS AND PHASE COLOURS

All cable ends connected up in switchgear, MCB panels etc;, shall have the insulation carefully cut back and the ends sealed with Hellerman rubber slip on cable end markers.

The markers shall be of appropriate phase colour for switch and all other live feeds to the details of the "Cable Insulation Colours" clause. Black cable with black end markers shall only be used for neutral cables.

p) CABLE INSULATION COLOURS

Unless otherwise stated in later clauses the insulation colours shall be in accordance with the following table.

Where other systems are installed the cable colours shall be in accordance with the details stated in the appropriate clause.

SYSTEM	INSULATION COLOUR	CABLE END MARKER
1) **Main and Sub-Main**		
a) Phase	Red	Red
b) Neutral	Black	Black
2) **Sub-Circuits Single Phase**		
a) Phase	Red	Red
b) Neutral	Black	Black

q) 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) $1.5mm^2$ for all lighting circuits indicated on the drawing.

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

(iii) 2.5mm^2 for one, two or three 5Amp sockets wired in parallel.

(iv) 2.5mm^2 for one 15Amp socket.

(v) 2.5mm^2 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.

r) SPACE FACTOR

The maximum number of cables that may be accommodated in a given size of conduit or trunking or duct is not to exceed the number in Tables B.5 and B.6 or as stated in Regulation B.91, B.117 and B.118 of the I.E.E Regulations whichever is appropriate.

s) 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.

t) 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

u) 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

v) 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

w) 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

x) 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.

y) LAMPHOLDERS

Shall be of extra heavy H.O skirted and shall be provided for every specified lighting fitting and shall be B.C;, E.S;, or G.E.S as required. All E.S. and G.E.S. holders shall be heavy brass type (except for plain pendants where the reinforced bakelite type shall be used). The screwed cap of the E.S and G.E.S. holders shall be connected to the neutral.

Where lampholders are supported by flexible cable, the holders shall have "cord grip" arrangements and in the case of metal shades earthing screws shall be provided on each of the holders.

The Sub-Contractor must order the appropriate type of holder when ordering lighting fittings, to ensure that the correct types of holders are provided irrespective of the type normally supplied by the manufacturers.

z) 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

aa) 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.

ab) 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.

ac) 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.

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.

ad) TESTING ON SITE

The Sub-contractor shall conduct during and at the completion of the installation and, if required, again at the expiration of the maintenance period, tests in accordance with the relevant section of the current edition of the Regulations for the electrical equipment of buildings issued by the I.E.E of Great Britain, the Government Electrical Specification and the Electric Supply Company's By-Laws.

a) Tests shall be carried out to prove that all single pole switches are installed in the 'live' conductor.

b) Tests shall be carried out to prove that all socket outlets and switched socket outlets are connected to the 'live' conductor in the terminal marked as such, and that each earth pin is effectively bonded to the earth continuity system. Tests shall be carried out to verify the continuity of all conductors of each 'ring' circuit.

c) Phase tests shall be carried out on completion of the installation to ensure that correct phase sequence is maintained throughout the installation. Triplicate copies of the results of the above tests shall be provided within 14 days of the witnessed tests and the Sub-contractor will be required to issue to the service engineer the requisite certificate upon completion as required by the regulations referred to above.

d) Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation made apparently by such inspections or tests shall be rectified by the Sub-contractor at his own expense.

e) The Sub-contractor shall provide accurate instruments and apparatus and all labour required to carry out the above tests. The instruments and apparatus shall be made available to the services engineer to enable him to carry out such tests as he may require.

f) The Sub-contractor shall generally attend on other contractors employed on the project and carry out such electrical tests as may be necessary.

g) 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.

h) 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 ELECTRICAL 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).

PART A

A. MINIMUM TECHNICAL SPECIFICATIONS FOR LED LAMPS/ LIGHTING FITTINGS

i) LED LIGHT FITTING (i.e. Batten, Panels, Downlight e.tc.) TECHNICAL SPECIFICATIONS IEC Compliant				
Item	Minimum Specifications	Proposed solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Operating	➢ voltage range: 130-300 V ac ➢ frequency range: 50-60Hz ➢ Power factor ≥ 0.9 lagging ➢ Total Harmonic Distortions (THD)<15% ➢ Ambient temperature range -10 to +35 °Operating ➢ Colour Consistency ≤ 5SDCM			
Performance	➢ System efficacy ≥ 90lm/W ➢ Lamp colour temperature ≥6500K ➢ Colour Rendering Index ≥ 80 ➢ Median useful life ≥ 30000 hr			
Standards Compliance	CB/EMC/CE			
General	➢ Driver/power unit/transformer - PSU-E ➢ Protection class IEC - Safety class II (II)			
General	➢ Driver/power unit/transformer - PSU-E ➢ Protection class IEC - Safety class II (II)			
Compliance				

B. SCHEDULE OF LIGHTING FITTINGS TO BE INSTALLED

SCHEDULE OF LIGHTING FITTINGS		
ITEM	**DESCRIPTION**	**TYPE**
1	Stage lighting equipment professional 350W sharply beam moving head beams stage light14r Beam 295 moving Head	**A**
2	200W 4-in-1 RGBW TV LED Profile Light Ellipsolidal Leko Stage Lighting Studio lighting Equipment as Sailwin (SW-LP200),2 channel led display	**B**
3	12W,Ø130mm,IP65, 6500K,Daylight,50000hrs, COB LED, ,200-260Vac,Surface mounted downlight Complete as Panasonic NNV70032WE1E or approved equivalent.	**C**
4	1200mm,IP65,36W,3600lm,100lm/Wpf 0.9,220V-240V,6500K,15000hrs Steel housing,PC optical cover,LEDBatten as philips or approved equivalent	**D**
5	Self Contained Emergency LED Exit 220-240V 50Hz, 3W,2V,800mAh as EXPLED/3M/s	**E**
6	600 mm x 600 mm,100lm/w, 36 W,3600lm,6500k,50,000hrs,200-260Vac,≥0.9p.f/50Hz, daylight, LED panel as panasonic NFV60200WE1E or approved equivalent.	**H**
7	Indoor LED Strip Lights,with self adhessive back,IP44,high quality flexible pvc,3000k warm white, 24 Volts (DC),12-72W,220-240vac power supply,30000hrs, with controler as Tronic SKUSSCOB1-WW or approved equivalent.	**S**

Bidders must provide technical brochures to determine technical compliance with these specifications.

PART B

IP CCTV SURVEILLANCE SYSTEM:

(i) GENERAL SPECIFICATIONS FOR THE CAMERAS

The cameras are classified into two main types a)
Fixed cameras –
These cameras have a fixed area of view depending on its angle of view and the focal length of the lens used.
They can be used in indoor and outdoor depending on the requirements. When used out door, the cameras are housed in a weather proof housing of IP66. Those used indoor come with different shapes of housings. The exview housings are used for cameras covering long distances like corridors and the dome housings are used for common areas like lobbies, security desks etc. b) Pan Tilt and Zoom Cameras
These cameras are only used to support the static cameras. They are useful as they are able to pan 360 degrees, tilt over 90 degrees and zoom into an object for Min 16 times and above. The cameras shall be indoor type and outdoor type with PoE/ 240V main supply with the appropriate power adaptors, 50Hz field frequency and operating according to the CCIR standard with minimum resolution of 2megapixels.
The camera shall be fixed on sliding rail track on the ceiling slab or walls as directed by the Electrical Engineer with an appropriate bracket.
It shall be possible to control the lens and the pan only head remotely via a remote control box at the control room. The Camera must be able to be controlled by a CCTV keyboard
They shall be linked to the Television Monitors and the Control Equipment through CAT 6 A cables as appropriate and according to the project Engineers instructions.
The mounting height and position of cameras shall be such that the desired coverage shall be achieved as distinctly as possible.
The digital signal processing (DSP) camera shall be aesthetically styled. The DSP chip will enable advanced video processing and manipulation to be carried out in the camera head.

(ii) MINIMUM REQUIREMENTS FOR THE PROPOSED CCTV SYSTEM

a) IP Dome camera (CCTV CAMERA TYPE 1)

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Product type	IP Camera			
	Product Features • IP 6MP Vandal Proof Dome camera • 1/1.8" CMOS imaging sensor with 120db WDR. • Fixed Lens length of 3.7 mm • IR Viewable Length 30m			

	• Minimum illumination 0.2lux (colour) • Frame rate of 30fps at 5MP • True day and night vision capability (ICR) • IP network capable – IPv4/IPv6 • PoE capability • H.265 video compression • Tampering detection, Loitering, Face Detection, Audio Detection, Motion detection, Sound Classification, Heat map, People Counting, Queue management, defocus detection, Bi-directional audio I/O communication, Network Disconnect, defog and event triggered alarm processing • Masking • Vandal proof IK-10 rating housing • Weather proof IP66 rating • ONVIF protocol Compliant			
Memory	Accessible Edge Storage with internal 128GB MicroSD card slot and complete with a 128GB MicroSD card			
Warranty	Comprehensive Manufacturer's Warranty (Attach Manufacturer's Warranty Statement) Minimum 3 Years			
Compliance				

(ii) 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.

(iii) CAMERA HOUSING

The camera housing shall:
Be IP66 rated with integral cable management.
Be Weatherproof and constructed from aluminum with epoxy coating.

(iv) CABLING

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Product type	Cables			
	Product Features • Solid copper, 24 AWG, 100 ? balanced twisted-pair (UTP). • Category 6A cables with four individually twisted • performance specifications in ANSI/TIA/EIA-568-B.2 up to 100 MHz			
Installation	• Cables shall be kept at a minimum distance of 150mm from items liable to become hot or cold. • Bending radii shall be not less than eight times the overall cable diameter. • cables must pass through conduits or trunking			

	• All cables and connectors shall be labelled • Cables shall have no joints			
Warranty	Comprehensive Manufacturer's Warranty (Attach Manufacturer's Warranty Statement) Minimum 3yrs			
Compliance				

NETWORK VIDEO RECORDER

The network video recorder shall have the following minimum requirements:

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Product type	Network Video Recorder			
	Product Features • 32 Channels • Throughput of at least • 200Mbps • Gigabit Ethernet connection • Multi-screen Display: Full/4/9/16 way or as appropriate. • 10 Hot swap HDDs each of 4TB minimum capacity • external storage support capability • VGA/HDMI local monitor • Redundant hot swap power supply			

	• Network management/viewer software • In built intelligent video analysis • H.265, MPEG, MJPEG Compression • ONVIF compatibility • Web viewer supported • PoE enabled • Smart Video Search Feature for streamlined Investigations • Recording resolution of 5MP • IP address filtering, user access log, authentication and encryption • Auto Launch of Video on specified Alarms/Events • LED status indicator • CE, UL certification			
Warranty	Comprehensive Manufacturer's Warranty (Attach Manufacturer's Warranty Statement) Minimum 3 Years			
Compliance				

(vi) CCTV MANAGEMENT SOFTWARE

CCTV management software with the following minimum specifications: -

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Product type	Network Video Recorder			
	Product Features • Event Recording Scheme • Operate Motion-Detector-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 the client's existing LAN / 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				

Warranty	Comprehensive Manufacturer's Warranty (Attach Manufacturer's Warranty Statement) Minimum 3 Years		
Compliance			

(vii) WORKSTATION

Item	Minimum Specification	Proposed Solution	Compliance	
TECHNICAL SPECIFICATIONS			Yes	No
Processor	Core i8			
System Memory	4GB			
Disk cache	64Bit			
Storage sub system	1TB GB SSD			
	48XCD –ROM and CD-Writer			
	1.44MB 3.5" FDD			
Display/Graphics	24" colour LCD			
Keyboard	PS/2 Enhanced keyboard			
Pointing device	PS/2 compatible optical mouse			
I/O interface	❖ 1xPS/2 – compatible keyboard ❖ 1xPS/2 – compatible mouse port ❖ 2x9 Pin Serial Ports ❖ 1x25 Pin parallel port ❖ 4xUSB Ports ❖ 1xRJ45 jack for ethernet ❖ 1xexternal VGA port ❖ HDMI			
Audio System	❖ PCI 3D audio/video cards ❖ TV/FM cards ❖ External Amplified speakers			

Communication Interface	❖ 10/100Mbs fast ethernet, RJ 45 jack ❖ 56K ITU V.90 data/fax modern, wake-on-ring ready			
Operating System Preload	Ms Windows XP Pro 2003 (or latest version)			
Application Software, pre-installed, registered and CDs supplied	Ms Windows Vista or Ms Windows XP Pro (Service Pack 2)			
Power sub-system	220-240V ac, 50HZ			
Power connectivity	Power cable compatible with CPU and UPS			
WARRANTY	3-year parts replacement warranty			
Compliance				

PART C
VISUAL & COMERCIAL DISPLAY

i. LCD PROJECTOR

Minimum Specifications

IMAGE

Colour Light Output - 6,000 lumen- 4,200 lumen (economy) in accordance with IDMS15.4

White Light Output - 6,000 lumen - 4,200 lumen (economy) in accordance with ISO 21118:2012

Resolution - WUXGA, 1920 x 1200, 16:10

Contrast Ratio - 2,500,000 : 1

Light source - Laser

Laser Light source - 20,000 Hours Durability High, 30,000 Hours Durability Eco

Keystone Correction - Manual vertical: ± 30 °, Manual horizontal ± 30 °

Colour Reproduction - upto 1.07 billion colours

OPTICAL

Projection Ratio - 1.35 - 2.20:1

Lens Shift - Manual Vertical ± 50 %, horizontal ± 20 %

Zoom - Manual, Factor: 1 - 1.6

Image Size - 50 inches - 500 inches

CONNECTIVITY

Interfaces

USB 2.0 Type A

USB 2.0 Type B, RS-232C

Ethernet interface (100 Base TX / 10 Base-T)

Wireless LAN IEEE 802.11a/b/g/n

VGA in (2x)

VGA out

HDMI in (2x), HDBaseT

Miracast

Stereo mini jack audio out

Stereo mini jack audio in (2x)

GENERAL

Energy Use - 353 W, 265 W (economy), 0.3 W (standby)

Supply Voltage - AC 100 V - 240 V, 50 Hz - 60 Hz

Product dimensions - 440 x 304 x 120 mm (Width x Depth x Height)

Product - weight 8.5 kg

Noise Level - Normal: 38 dB (A) - Economy: 27 dB (A)

Temperature - Storage -10° C - 60° C

Humidity - Operation 20% - 80%, Storage 10% - 90%

TECHNOLOGY

Projection System - 3LCD Technology, RGB liquid crystal shutter

LCD Panel - 0.67 inch with D10

WARRANTY

Comprehensive Manufacturer's Warranty (Attach Warranty Statement)

ii. **INTERACTIVE WHITEBOARD**

Minimum Specifications

INPUT BLOCK

Panel Dimensions

- (H x W) 35.4 x 64.0 in. (900 x 1,625 mm)

Number of Sheets

- 2 (endless type)

Copying Area

- (H x W) 33.5 x 63.5 in. (850 x 1,613 mm)

Scanning Resolution

- Standard-size: 44 dpi x 44 dpi, Full-size: 61 dpi x 44 dpi

Time Required for Scanning

- Approx. 15 sec/sheet

Scanning System

- CIS (Contact Image Sensor)

PAPER OUTPUT BLOCK

Printing System

- Fusion thermal transfer type

Copy Paper

- Standard / Recycled paper (16 - 24 lbs / 60 - 90 g/m2)

Copy Paper Size

- Letter

Copy Density

- 8 dots/mm

Copy Color

- Monochrome

Continuous Copies

- 1 to 9

Contrast Adjustment

- Two levels: Normal / Dark

2-Screen Compressed Copying

- Yes

MEMORY OUTPUT BLOCK

Supported Memory Type

- USB Flash Memory Device (Sold separately)

USB Interface

- Full Speed USB 2.0 (A-type connector)

Supported Formats

- FAT(FAT16)/FAT32 (up to 32 GB)

Storage File Formats

- TIFF, PDF

Saved File Color

- Monochrome
-

SYSTEM REQUIREMENTS

Computer

- IBM® PC/AT or compatible machine

CPU

- Intel® Pentium II or higher processor

Interface

- Full Speed USB 2.0 (B-type connector)

Operating System

- Windows® XP (SP3 or later), Windows Vista®, Windows® 7

INCLUDED ACCESSORIES AND CONSUMABLES

- 2 Black Markers / Eraser / Thermal Transfer Film (starter roll) / Wall-Mounting Brackets / Cord / Lithium Battery / Warranty Card / Operating Instructions / Installation Manual

OPTIONAL ACCESSORIES

Stand

- UE-608005

Replacement Film

- UG-6001 (2 rolls, 164.0 ft. (50 m))

Markers

- KX-B031 (10 black markers) / KX-B032 (10 red markers) / KX-B033 (10 blue markers)

Erasers

- KX-B042 (6 erasers)

Marker and Eraser Set

- KX-B035 (1 black, 1 red, 1 blue, 1 eraser)

WARRANTY

Comprehensive Manufacturer's Warranty (Attach Warranty Statement)

iii. **1000 VA UPS**

Minimum Specifications

Main

Main Input Voltage - 230 V

Other Input Voltage - 220 V, 240 V

Main Output Voltage - 230 V

Other Output Voltage - 220 V, 240 V

Rated power in W - 600 W

Rated power in VA - 1000 VA

Input Connection Type - IEC 320 C14

Output connection type

- 4 IEC 320 C132
- IEC Jumpers

Number of rack unit - 2U

Number of cables - 1

Battery type - Lead-acid battery

Provided equipment

- Documentation CD
- Installation guide
- Rack mounting brackets
- USB cable

General

Number of power module filled

Slots - 0

Number of power module free slots - 0

Product web sub-family - Cloud-enabled monitoring

Redundant – No

Physical

Colour - Black

Height - 8.6 cm

Width - 43.2 cm

Depth - 40.6 cm

Net weight - 20.52 kg

Mounting location - Front

Mounting preference - Lower

Mounting mode - Rack-mounted

Two post mountable - 1

USB compatible – Yes

Input

Input voltage limits

- 170...300 V adjustable
- 180...287 V

Network frequency - 50/60 Hz +/- 3 Hz auto-sensing

Output

Harmonic distortion - Less than 5 %

Maximum configurable power in VA - 1000 VA

Maximum configurable power in W - 600 W

Transfer time - 6 ms typical : 10 ms maximum

UPS type - Line interactive

Wave type - Sine wave

Output frequency - 50/60 Hz +/- 3 Hz sync to mains

Conformance

Product certifications

- C-Tick
- CE

- GOST
- VDE

Standards

- EN/IEC 62040-1:2019/A11:2021
- EN/IEC 62040-2:2006/AC:2006
- EN/IEC 62040-2:2018

Environmental

Acoustic level - 42 dBA

Heat dissipation - 46 Btu/h

Operating altitude ; 0...10000 ft

Ambient air temperature for operation; 0...40 °C

Ambient air temperature for storage; -15...45 °C

Storage altitude; 0.00...15240.00 m

Relative humidity; 0...95 %

Storage Relative Humidity; 0...95 %

Batteries & Runtime

Extended runtime - 0

Number of battery filled slots - 0

Number of battery free slots - 0

Battery recharge time - 3 h

Number of battery replacement quantity - 1

Battery life - 4...6 year(s)

Replacement battery - APCRBC124

Battery power in VAH - 216 VAh runtime

Battery charger power - 72 W rated

Communications & Management

Alarm - Alarm when on battery : distinctive low battery alarm : configurable delays

Control panel - Multifunction LCD status and control console

Free slots – 0

Surge Protection and Filtering

Surge energy rate - 459 J

Noise suppression - Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449

Offer Sustainability

Sustainable offer status - Green Premium product

REACh Regulation - REACh Declaration

EU RoHS Directive - Compliant

Mercury free - Yes

RoHS exemption information - Yes

Optimized Energy Efficiency - Energy efficient product

Take-back - Take-back program available

WARRANTY

Comprehensive Manufacturer's Warranty (Attach Warranty Statement)

iv. LAPTOP COMPUTER

Minimum Specifications

Operating System

- Windows 10 Pro 64
- Windows 10 Home 64
- Windows 7 Professional 64
- Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro 64)
- FreeDOS 2.0

Processor Family

- Intel® Xeon® processor; Intel® Core™ i7 processor; Intel® Core™ i5 processor

Processors

- Intel® Xeon® E3-1575M v5 with Intel® Iris™ Pro Graphics P580 (Available 1H16); Intel® Xeon® E3-1535M v5 with Intel® HD graphics P530 (2.90 GHz, up to 3.80 GHz with Intel Turbo Boost Technology, 2133 MHz, 8 MB L3 Cache, 4 cores);
- Intel® Core™ i7-6820HQ with Intel® HD graphics 530 (2.70 GHz, up to 3.60 GHz with Intel Turbo Boost Technology, 2133 MHz, 8 MB L3 Cache, 4 cores);
- Intel® Core™ i7-6700HQ with Intel® HD graphics 530 (2.60 GHz, up to 3.50 GHz with Intel Turbo Boost Technology, 2133 MHz, 6 MB L3 Cache, 4 cores);

- Intel® Core™ i5-6440HQ with Intel® HD graphics 530 (2.60 GHz, up to 3.50 GHz with Intel Turbo Boost Technology, 2133 MHz, 6 MB L3 Cache, 4 cores)

Chipset

- Mobile Intel® CM236

Maximum Memory

- 64 GB DDR4-2133 ECC SDRAM or 64 GB DDR4-2133 non-ECC SDRAM
- (Transfer rates up to 2133 MT/s. non-ECC memory only available with Intel® Core™ procesors. ECC memory only available with Intel® Xeon® processors.)

Internal Storage

- 500 GB up to 1 TB SATA (7200 rpm)
- 500 GB SATA SED (7200 rpm)
- 500 GB SATA SED FIPS 140-2 (7200 rpm)
- 500 GB (8 GB cache) SATA SSHD
- 256 GB up to 512 GB M.2 SATA SED SSD
- 256 GB up to 1 TB HP Z Turbo Drive G2 (NVMe PCIe SSD)

Display

- 17.3" diagonal HD+ SVA anti-glare LED-backlit (1600 x 900);
- 17.3" diagonal FHD UWVA IPS anti-glare LED-backlit (1920 x 1080);
- 17.3" diagonal FHD Touch UWVA IPS LED-backlit (1920 x 1080);
- 17.3" diagonal UHD DreamColor UWVA IPS anti-glare + PSR LED-backlit (3840 X 2160)

Available Graphics

Integrated:

- Intel® HD graphics 530;
- Intel® HD graphics P530;
- Intel® Iris™ Pro Graphics P580 (available 1H16)

Discrete:

- NVIDIA® Quadro® M5000M (8 GB dedicated GDDR5);
- NVIDIA® Quadro® M4000M (4 GB dedicated GDDR5);
- NVIDIA® Quadro® M3000M (4 GB dedicated GDDR5);
- NVIDIA® Quadro® M2000M (4 GB dedicated GDDR5);
- NVIDIA® Quadro® M1000M (2 GB dedicated GDDR5);
- AMD FirePro™ W6150M (4 GB dedicated GDDR5)
- (Intel® HD Graphics 530 integrated on Core™ i7 and Core™ i5 processors. Intel® HD Graphics P530 and Intel® Iris™ Pro Graphics P580 integrated on Xeon® processors.)

Expansion Slots

- 1 SD UHS-II flash media; 1 smart card reader
- (SD supports next generation secure digital and is backward compatible to SDHC, SDXC)

Ports and Connectors

- ***Left side:*** 1 RJ-45; 2 USB 3.0; 1 USB 3.0 (charging)
- ***Right side:*** 1 power connector; 2 Thunderbolt™ 3; 1 VGA; 1 HDMI 1.4; 1 USB 3.0; 1 stereo microphone-in/headphone-out combo

Networking

LAN: Integrated Intel® I219-LM Gigabit Network Connection

WLAN: Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2x2) Wi-Fi and Bluetooth® 4.0 combo; Intel® Dual Band Wireless-AC 8260 802.11 a/b/g/n/ac (2x2)

non-vPro Wi-Fi and Bluetooth® 4.0 combo

WWAN: HP lt4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module; HP hs3110 HSPA+ Intel® Mobile Broadband Module

Audio

- Bang & Olufsen HD audio
- Integrated stereo speakers and microphone (dual-microphone array when equipped with optional webcam)
- Button for volume mute
- Functions keys for volume up and down
- Combo microphone-in/stereo headphone-out jack

Input Device

- HP Spill Resistant Keyboard (backlit with function key control
- Image sensor touchpad with on/off button, two-way scroll, gestures, three pick buttons
- Pointstick with three additional pointstick buttons

Camera

- 720p HD webcam

Power

- 200 W Slim Smart AC adapter (external)
- HP Long Life 6-cell 96 WHr Li-ion prismatic

Security

- Integrated smart card reader
- One-step logon

- Common Criteria EAL4+ Augmented Certified Discrete TPM 1.2/2.0 Embedded Security Chip
- Security lock slot
- Support for Intel® AT
- HP FingerPrint Sensor (optional)
- Absolute Persistence Module
- HP BIOSphere with Sure Start
- SATA port disablement (via BIOS)
- DriveLock and Automatic DriveLock
- RAID (available as a configurable option) - Serial, parallel, USB enable/disable (via BIOS)
- Optional USB port disable at factory (user configurable via BIOS)
- Removable media write/boot control
- Power-on password (via BIOS)
- Setup password (via BIOS)

Software

- HP Performance Advisor
- HP Remote Graphics Software
- HP Velocity
- HP Client Security
- Microsoft Security Essentials
- HP ePrint Driver
- HP Recovery Manager
- Foxit PhantomPDF Express

Dimensions

- 16.5 x 11 x 1.2 in
- 420 x 280 x 30 mm

Weight

- Starting at 6.62 lb
- Starting at 3 kg

Energy Efficiency Compliance

ENERGY STAR® certified and EPEAT® registered configurations available

Environmental

Low halogen

Warranty

Protected by HP Services, including a standard limited 3 years parts, 3 years labor, and 3 years onsite service (3/3/3) warranty.

Certain restrictions and exclusions apply.

I) LCD DIGITAL SIGNAGE

- Designed with an industrial-grade panel.
- Includes a mainstream quad-core CPU, Android system, and decodes up to 4K resolution.
- Plays and releases programs in multiple modes.
- With intelligent split screen, its page layout can be freely adjusted, making it suitable for a variety of scenes.
- Designed with B/S architecture, the device manages programs by time and location, and generates operation reports.
- The device offers unified platform management, and can be remotely controlled by the platform.

PART D

CREATIVE FLEXIBLE INDOOR RENTAL LED

1. Led screen cabinet

Indoor Flexible rental cabinet P3.91, 500*500mm, rear service, Die-cast Magnesium frame, IP20 front and IP 20 rear, 7680hz, brightness:1000 nits, 2 year warranty

2. Led sending box

1. Supports common video input connectors, including 2xDVI, 2xHDMI 1.4, and 1x3G-SDI + loop, with 10xGigabit Ethernet ports and 2x10G optical fiber output connectors.

2. Supports simultaneous display of 3 signals with customizable screen size and position.

3. Supports both quick screen configuration and advanced screen configuration, enabling fast setup without a computer.

4. Supports custom adjustment of HDMI and DVI input resolutions.

5. Supports backup between devices and within device ports to ensure normal screen operation in case of device or network cable failure.

6. Maximum video output capacity of 6.5 million pixels (10 Ethernet ports), with a maximum width of 10,240 pixels and a maximum height of 8,192 pixels.

7. Supports screen brightness adjustment with 100 levels via a rotary knob.

8. Supports point-level brightness and chroma calibration, effectively eliminating color differences in LED modules, ensuring uniform screen brightness and color, and enhancing display quality.

9. Supports creating and saving no fewer than 10 user scenarios as templates for easy reuse.

10. Supports selecting HDMI or DVI input sources as synchronization signals to achieve frame-level output synchronization.

11. Supports independent audio input and HDMI-embedded audio modes, with optional audio output via a multifunction card.

12. The front panel features an intuitive LCD display for monitoring port communication status, device model, IP address, screen size, signal source status, and more, simplifying system operation.

13. Includes a built-in intelligent light sensor connector for automatic LED screen brightness adjustment.

14. Integrates video processing and sending card functions to simplify the system structure and improve stability and compatibility.

15. Supports LED display output image quality adjustments, including brightness, contrast, saturation, hue, and gamma correction.

16. Supports simultaneous optical and network output with optical signal backup and optical-to-electrical conversion.

17. Optical port 1 can be used as a video input connector to input and mosaic two 2K signals.

18. Supports HDMI preview and output, allowing LED screen monitoring when connected to a display.

19. Supports multiple devices cascading and loading for smooth, tear-free images.

20. Supports active shutter 3D functionality, requiring a 3D emitter and compatible 3D glasses.

21. Supports USB playback for instant plug-and-play convenience

22. Multiple device modes and operation modes, convenient and efficient

3. Technical Specification

Creative flexible indoor rental led

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Product type	CREATIVE FLEXIBLE INDOOR RENTAL LED			
	Parameters			
	Pixel Pitch - 3.91mm			
	Pixel Configuration -1R1G1B			
	LED Type -SMD2020			
	Brightness (Max) 1000 nit			
	Color Temperature- 6500K-9300K (adjustable)			
	Viewing Angle- H160° / V160°			

	Pixel Density- 65,536 dots/m^2			
	Module Size - W500mm×H250mm			
	Module Resolution -128x64 dots			
	Cabinet Size - W500mm×H500mm×D83mm			
	Cabinet Resolution -128×128 dots			
	Cabinet Size - W500mm×H500mm×D83mm			
	Cabinet Resolution -128×128 dots			
	Cabinet Material -Die-cast Magnesium			
	Operating Temperature/ Humidity - 10℃~+40℃/10~80%RH			
	Storage Temperature/ Humidity - 20℃~+60℃/10~80%RH			
	IP Rating -Front IP20/Rear IP20			
	Aspect Ratio -1:1			
	Gray Scale -16 bits			
	Contrast Ratio -6000:1			
	Refresh Rate -7680Hz			
	Input Voltage -AC 110~220V (+/-10%)			
	Input Power (max) -570 W/m2			
	Input Power (Avg) -240 W/m2			

PART E

STRUCTURED CABLING

1. NETWORK CABINETS

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Product type	Ventilated rack with fans where applicable			
Construction	• Detachable composite structure • 600x800mm • Material: SPCC quality cold rolled steel • Thickness: Square hole Strips 2.0mm, others 1.2mm			
Power	• Pre-wired 240V AC conditioned grounded power circuit • Supplied with Earth Bond Kit and Cage nuts			
Warranty	Comprehensive Manufacturer's Warranty (Attach Manufacturer's Warranty Statement) Minimum 3 Years			
Compliance				

2. CABLES – HORIZONTAL CABLING AND PATCH CORD

Item	Minimum specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Construction	• CAT 6A STP • Solid (non-tinned) copper • Centre Isolation Member			

Jacket	8.5mm with Sequential meter markings			
Industry Compliance	ISO/IEC 11801 Ed. 2.2 (Class EA) ISO/IEC 61156-5 (Category 6A)			
	TIA-568-C.2 (Category 6A) LSOH: ISO/IEC 60332, IEC 60754, IEC 61034 EN50399 Class Eca			
Warranty	End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement) Minimum 15 Years Warranty			
Compliance				

3. CAT 6A STP PATCH PANELS

Item	Minimum specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Industry Compliance	STANDARDS COMPLIANCE • ANSI/TIA-568-C.2 • ISO/IEC 11801 Ed 2.2 • ETL Tested • IEC 60603-7 • IEC 60603-7-51 • IEEE 802.3an • IEEE 802.3af (PoE) • IEEE 802.3at (PoE+) • ANSI/TIA-1096-A			
Warranty	End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement) Minimum 15Years			
Compliance				

4. FACEPLATES

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Construction	• Complete with single MAX RJ45 Modules • Single gang faceplates for each designated work area point. • UV resistant, high impact plastic			
Wiring	T568A and T568B			
Face Plate Characteristics	• Single • Label Covers- Faceplates include pressure-release designation label covers for quick, tool-less removal • With icon/label provision • With doors/shutters • British Standard (85mm x 85mm) • White			
Module Characteristics	• 1000/100/10Gbs • Backward compatible			
Standards	• ISO/IEC 11801: 2002 2nd Edition (Category 6) • ANSI/TIA/IEC 754 and IEC 1034 IEC 61156-5 1st Edition • LSOH: IEC 754 and IEC 1034 • UL CMX • UL CMP and CSA FT6			

Warranty	End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement) Minimum 15 Years			
Compliance				

5. FIBRE

i) BACKBONE MULTIMODE FIBRE OPTIC CABLE

Item	Minimum Specifications	Proposed solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		YES	NO
Construction	Steel Tape Armoured with Glass Yarn			
Armour	Corrugated Steel Tape Armour			
Cable characteristics	• Support for 10GBASE-T			
	• Low Density Polyethylene • Sheath			
	• Gel Filled Loose Buffer Tube • Level 1 Rodent Protection • Crash(N) at least 2500 • Torsion (Turns/M) not more than 5 • Multimode			

Industry Compliance	• RoHS compliant • ISO/IEC 11801:2002 OM3 • ANSI/TIA/EIA568-B.3 • ANSI/TIA/EIA- • 568-B.3-1 • ANSI/TIA-598-C • Telcordia GR-409CORE • LSOH: IEC 60332-1, IEC 61034, IEC 60754 • OFNR: Communications Type OFNR(UL) and FT4 c(UL) TIA-492AAAC laser bandwidth DMD specification • IEC 60793-2-49 and TIA/EIA 455220 DMD measurement test procedure			
Warranty	End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement) Minimum 15 Years			
Compliance				

ii) BACKBONE DISTRIBUTION FIBRE PATCH CORDS

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		Yes	No
Construction	Precision cable assembly			
Features	• Easy Identification- Connectors color coded per ANSI/TIA/EIA-568-B.3 • Dust Caps- Dust caps included to protect polished ferrule from dirt and damage • Polarity Connection- LC Duplexing clip for polarity correction			
Industry Compliance	• IEEE802.3ae standard • TIA/EIA and ISO/IEC requirements for aging, exposure to humidity, temperature extremes, impact, vibration, coupling strength, and cable resistance to stress and strain. • EMC/EMI Specifications			

Warranty	End-to-End Manufacturer's Warranty on Cabling System (Attach Manufacturer's Warranty Statement) Minimum 15 Years			
Compliance				

6. ACTIVE DEVICES

(i) ACTIVE CONTROL EQUIPMENTS AT THE LAN EDGE

Active control equipment at the LAN Edge should have the following features:

Item	Minimum Specifications	Proposed Solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		YES	NO
Product type	Data floor Switch			
	Product Features • Switching capacity of at least 56Gbps • Stacking bandwidth of at least 80Gbps • At least 16,000 MAC Addresses • At least 512 Total • Switched Virtual Interfaces (SVIs) • Full Power over Ethernet Plus (PoE+) capability • Modular uplinks of 4x 1G fixed uplinks or more • 48 Ethernet 10/100/1000 Full PoE ports, • 4 - SFP transceiver-based Gigabit multimode Fiber ports • 1 Management port	4 – SFP Gigabit multimode Fiber ports		

	• 1 console port			
Memory	• At least 2GB DRAM • At least 4GB flash			
Warranty	Comprehensive Manufacturer's Warranty (Attach Manufacturer's Warranty Statement) Minimum 3 Years			
Compliance				

(ii) RACKMOUNT UPS

Item	Minimum Specifications	Proposed solution	Compliance	
Brand	State the brand, model and attach Technical Brochure (Mandatory)		YES	NO
Features	Rack Mounted Output • Max Configurable Power (1.KVA) • Nominal Output Voltage: 240V • Output Voltage Distortion: Less than 5% • Output Frequency (sync to mains): 50 Hz • Line Interactive			
	• Waveform Type: Sine wave Input • 320 C13 (Battery Backup) Nominal Input Voltage: • 240V • Input Frequency: 50/60 Hz +/- 3 Hz (auto sensing) • Input Connections: IEC-320C20			

	• Input voltage range for main operations 180 - 287 V Batteries &amp: Runtime • Battery Type: Maintenance free sealed Lead-Acid battery with suspended electrolyte: leakproof • Typical recharge time: 3 hour(s) • Replacement Battery: YES • RBC Quantity: 1 Surge Protection and Filtering • Surge energy rating: 300 Joules • Filtering: Full time multi-pole noise filtering: 0.3% IEEE surge let-through: zero clamping Response time: meets UL 1449			
Support	Locally Available Technical Support Services (Manufacturer's Letter of Authorization Mandatory)			
Warranty	Manufacturer's Limited Lifetime Warranty Minimum 2 years- repair or replace			
Compliance				

Manufacturer's Brochures MUST be provided for all the above Listed items.

7. ADDITIONAL NOTES

Tenderers should take note of the following The network should be capable of carrying data, voice and video. QOS should be considered as part of installation and configuration of the network.

b All active LAN equipment should be from the same manufacturer for seamless integration, management and maintenance.

c Each floor should have a telecommunication Closet to house the necessary structured cabling components and active equipment.

8. FIELD QUALITY CONTROL

Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty program.

9. LABELING

Use 6d if the type of termination block permits labels. Otherwise use 6e.
Use 6g if the owner does not have a standard for outlet numbering. Use 6h if required. Alter time as requested.
Labeling shall conform to ANSI/TIA/EIA-606(A) standards. In addition, provide the following:
Label each outlet with permanent self-adhesive label with minimum 3/16 in. high characters.
Label each cable with permanent self-adhesive label with minimum, 1/8 in. high characters, in the following locations:

1) Inside receptacle box at the work area.

2) Behind the communication closet patch panel or punch block.

Use labels on face of data patch panels. Provide facility assignment records in a protective cover at each telecommunications closet location that is specific to the facilities terminated therein.
Use color-coded labels for each termination field that conforms to ANSI/TIA/EIA-606(A) standard color codes for termination blocks.
Mount termination blocks on color-coded backboards.
Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.
Label cables, outlets, patch panels, and punch blocks with room number in which outlet is located, followed by a single letter suffix to indicate particular outlet within room, i.e., S2107A, S2107B. Indicate riser cables by an R then pair or cable number.
Mark up floor plans showing outlet locations, type, and cable marking of cables. Turn these drawings over to the owner two (2) weeks prior to move in to allow the owner's personnel to connect and test owner-provided equipment in a timely fashion.
Three (3) sets of as-built drawing shall be delivered to the owner within four (4) weeks of acceptance of project by the owner. A set of as-built drawings shall be provided to the owner in magnetic media form and utilizing CAD software that is acceptable to the owner. The magnetic media shall be delivered to the owner within six (6) weeks of acceptance of project by owner.

10. TESTING

Testing shall conform to ANSI/TIA/EIA-568-B.1 standard. Testing shall be accomplished using level IIe or higher field testers.

Test each pair and shield of each cable for opens, shorts, grounds, and pair reversal. Correct grounded, and reversed pairs. Examine open and shorted pairs to determine if problem is caused by improper termination. If termination is proper, tag bad pairs at both ends and note on termination sheets.

Perform testing of copper cables with tester meeting ANSI/TIA/EIA-568-B.1 requirements.

If copper backbone cable contains more than one (1) percent bad pairs, remove and replace entire cable.

If copper cables contain more than the following quantity of bad pairs, or if outer sheath damage is cause of bad pairs, remove and replace the entire cable:

CABLE SIZE	MAXIMUM BAD PAIRS
<100	1
101 to 300	1 – 3
301 to 600	3 – 6
>601	6

If horizontal cable contains bad conductors or shield, remove and replace cable.

Initially test optical cable with a light source and power meter utilizing procedures as stated in ANSI/TIA/EIA-526-14A: OFSTP-14A Optical Power Loss Measurements of Installed Multimode

Fiber Cable Plant and ANSI/TIA/EIA-526-7 Measurement of Optical Power Loss of Installed Single Mode Fiber Cable Plant. Measured results shall be plus/minus 1 dB of submitted loss budget calculations. If loss figures are outside this range, test cable with optical time domain reflectometer to determine cause of variation.

Correct improper splices and replace damaged cables at no charge to the owner.

Cables shall be tested at 850 and 1300 nm for multimode optical fiber cables.

Cables shall be tested at 1310 and 1550 nm for single mode optical fibers.

Testing procedures shall utilize “Method B” – One jumper reference.

Bi-directional testing of optical fibers is required.

Perform optical time domain reflectometer (OTDR) testing on each fiber optic conductor.

Measured results shall be plus/minus 1 dB of submitted loss budget calculations.

Submit printout for each cable tested.

Submit 3.5 in. disks with test results and program to view results.

Where any portion of system does not meet the specifications, correct deviation and repeat applicable testing at no additional cost.

11. BROCHURES AND TECHNICAL LITERATURE

Tenderers Must enclose together with their submitted bids Brochures detailing Technical Literature and specifications of the active components of the structured cabling system. The brochures shall be used to evaluate the suitability of these components.

Any bid submitted without the brochures shall be considered technically non-responsive, and may subsequently be disqualified.

SCHEDULE OF CONTRACT DRAWINGS

DRAWING NO.	DRAWING TITLE
As shall be issued by the Engineer	

NOTE:

Tenderers are advised to inspect the electrical drawings at the office of the Chief Engineer (Electrical) – State Department for Public Works, at Chief Engineer's (Electrical) Office, Hill Plaza Building, Community area, Nairobi along Ngong road, during normal working hours.

SECTION D

TECHNICAL SCHEDULE

TECHNICAL SCHEDULE

1. The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders, especially where the tenderer intends to supply or has based his tender sum on equipment, which differs in manufacture, type or performance from the specifications indicated by the Project Manager.
2. This schedule shall form part of the technical evaluation criterion, and tenderers are therefore advised to complete the schedule as they shall be considered nonresponsive.

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

(Must be completed by the Tenderer)

ITEM	DESCRIPTION	TYPE/MAKE	MODEL	COUNTRY OF ORIGIN
1	Data Switches			
2	CAT 6A Cables			
3	Wireless Access Points			
4	Faceplate			
5	Fiber Optic Cable			
6	CCTV Cameras			
7	Light Fittings			
8	Switches/sockets			
9	Power Cables			
10	UPS			
11	Distribution Board			
12	Circuit Breakers (MCBs/MCCBs)			

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 authorized 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 subcontract 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 and all taxes applicable at the time of tender.

SCHEDULE OF UNIT RATES

(To be completed by the Tenderer)

ITEM	DESCRIPTION	QTY/UNIT	RATE(KSHS)
1.	125A MCCB	1No.	
2.	16 CH NVR	1No.	
3.	LED Flood lights: a) 30 Watts b) 100 Watts	 1No. 1No.	
4.	PVC/SWA/PVC Copper cable: a) 10.0mm sq. 2 core b) 10.0 mm sq 4core	 1M 1M	
5.	Distribution Boards/Consumer unit as Merlin Gerin or an approved equivalent: a) 12 Way TPN Distribution Board b) 12way Consumer unit c) 4-way consumer unit	 1No. 1No. 1No.	
6.	Network Switches Port Switch Rack Mountable with PoE and as described in the particular specifications a) 24 Port PoE switch	 1No.	
7.	Cat 7A UTP 8-Pair indoor cable	1No.	
8.	Network Cabinets a) 22U Data Cabinet b) 42U Data Cabinet	 1No. 1No.	
9	8 core multimode fibre optic cable	1m.	

SECTION F

BILLS OF QUANTITIES

BILLS OF QUANTITIES

SPECIAL 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 subcontract 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 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.

PRICING OF PRELIMINARIES ITEMS

Prices will be inserted against item of preliminaries in the Contractor's Bills of Quantities and specification. These Bills are designated as Bill No.1 in this Section. Where the Contractor fails to insert his price in any item, he shall be deemed to have made adequate provision for this on various items in the Bills of Quantities. The preliminaries form part of this contract and together with other Bills of Quantities covers for the costs involved in complying with all the requirements for the proper execution of the whole of the works in the contract.

The Bills of Quantities are divided generally into three sections:

(a) Preliminaries – Bill No.1

Contractor's preliminaries are as per those described in section C – Contract Preliminaries and General Conditions of Contract. The 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 – Other Bills

(i) 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.

(ii) The unit of measurements and observations are as per those described in clause 1.0 5 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 Contract shall insert his totals and enter his grand total tender sum in the space provided below the summary.

This grand total tender sum shall be entered in the Form of Tender provided elsewhere in this document.

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD					
ELECTRICAL INSTALLATION WORKS					
BILL NO.1: SUB CONTRACT PRELIMINARIES					
ITEM	**DESCRIPTION**	**QTY**	**UNIT**	**RATE (Kshs)**	**AMOUNT (Kshs)**
1	Samples and materials generally clause - The Sub- contractor shall, when required, provide for approval at no extra cost, samples of all materials to be incorporated in the works. Such samples, when approved, shall be retained by the Engineer and shall form the standard for all such materials incorporated.	1	Item		
3	Setting to work and regulating system clause- No testing or commissioning shall be undertaken except in the presence of and to the satisfaction of the Engineer unless otherwise stated by him (Sub-contractor's own preliminary and proving tests excepted). It will be deemed that the Sub-contractor has included in the Sub-contract Sum for the costs of all fuel, power, water and the like, for testing and commissioning as required.				
4	Identification of plant components clause - Sub-contractor shall supply and fix identification labels to all plant, starters, switches and items of control equipment etc with white traffolyte or equal labels engraved in red lettering denoting its name, function and section controlled.				
5	Working drawings clause - Sub-contractor shall prepare such Working Drawings as may be necessary. The Working Drawings shall be complete in such detail not only that the Sub-contract Works can be executed on site but also that the Engineer can approve the Sub-contractor's proposals, detailed designs and intentions in the execution of the Sub-contract Works.	1	Item		
6	Records Drawings (As Installed) and instructions clause - Record Drawings, will be subject to the approval of the Engineer, include approved Working Drawings adjusted as necessary and certified by the Sub-contractor as a correct record of the installation of the Sub-contract Works.	1	Item		
7	Testing and inspection - manufactured plant clause - The Engineer reserves the right to inspect and test or witness of all manufactured plant equipment and materials. The right of the Engineer relating to the inspection, examination and testing of plant during manufacture. Sub-contractor shall give two weeks' notice to the Engineer of his intention to carry out any inspection or tests and the Engineer or his representative shall be entitled to witness such tests and inspections	1	Item		
8	Initial Maintenance Clause - The sub-contractor shall make routine maintenance once a month during the liability for the Defects Period and shall carry out all necessary adjustments and repairs, cleaning and oiling of moving parts. A monthly report of the inspection and any works done upon the installation shall be supplied to the Engineer. Shall allow in the sub-contract Sum of the initial maintenance, inspection and break-down service	1	Item		
9	Supervision by Project Electrical Engineer - The sub-contractor shall in his tender allow for the provision of management meetings and site inspections, as	1	Item	96,000	96,000.00
10	Profit and Attendance for the above item	1	%		
11	Any other preliminaries				
	TOTAL FOR BILL NO.1: SUB CONTRACT PRELIMINARIES C/F TO SUMMARY PAGE				

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD					
ELECTRICAL INSTALLATION WORKS					
BILL NO.2: ELECTRICAL WORKS - FIRST FLOOR					
Item	**Description**	**Qty**	**Unit**	**Rate (Kshs)**	**Amount (Kshs)**
	Supply, Install, test and commission the following :				
	LIGHTING POINTS				
A	Lighting points wired in 3x1.5mm^2 PVC SC Copper Cables drawn in concealed 20mm Diameter HG PVC conduits complete with all necessary accessories but excluding switches for:-				
	(a) One Way Switching.	72	No.		
	(b) Two Way Switching.	24	No.		
	LIGHTING SWITCHES				
B	10A white screwless witch plates as Clipsal or approved equivalent as follows:				
	(a) 1 gang 1 way	10	No.		
	(b) 1 gang 2 way	6	No.		
	(c) 2 gang 2 way	8	No.		
	(d) intermediate switch	4	No.		
	LIGHTING FITTINGS				
C	Lighting fittings complete with all accessories including lamps of appropriate wattage and colour rendering and fixing materials as follows:				
	(a) Type A	6	No.		
	(b) Type B	6	No.		
	(c) Type C	36	No.		
	(d) Type D	8	No.		
	(e) Type E	6	No.		
	(f) Type H	12	No.		
	(g) Type S	380	LM		
	TRUNKING & DUCTING				
D	**i)** 200x50mm two (2) compartment powder coated steel trunking manufactured in 14 swg galvanized mild steel sheet , complete with covers, bends, cable tie slots and all fixing accessories for coupling and earthing as Schneider Electric or approved equivalent.	180	Lm.		
	ii) Powder coated twin punched outlet plate for fixing twin socket outlets.	24	No.		
	iii) Powder coated single punched outlet plate for fixing data/DP switch.	10	No.		
	SOCKET OUTLETS AND OTHER POWER POINTS				
E	Ring mains socket outlet points comprising wiring in 3x2.5mm sq. single core PVC insulated copper cables drawn in concealed 25mm diameter Heavy Gauge white PVC conduits complete with saddles,pattress box and all the necessary accessories.	36	No.		
F	13A switched screwless white moulded case socket outlet plates as Clipsal or an approved equivalent.				
	(a) Twin outlet.	36	No.		
G	**Floor Distribution Boxes:** floor recessed/mounted power/data outlet station completewith 2No. 13A twin standard switched socket outlets for raw power, 2No. single data cable outlet plates and wiring in 3 x 2.5mm2 SC-PVC-CU cables. To be constructed from high quality 14SWG powder coated pre-galvanised steel sheets and cover.	6	No.		
H	**Hand Drier Power Point (1 phase)** comprising wiring drawn in 3x2.5 mm2 PVC-SC-CU cables in concealed 25mm diameter HG PVC conduits in complete with all accessories but excluding the D.P switch (average 50m).	2	No.		
I	20A DP Control Switch marked 'As Per Application' with neon light and cord outlet for item above as Clipsal or approved equivalent.	2	No.		
	Sub-Total C/F to the Next Page				

BILL NO.2: ELECTRICAL WORKS - FIRST FLOOR CONTINUED					
Item	**Description**	**Qty**	**Unit**	**Rate (Kshs)**	**Amount (Kshs)**
	Sub-Total B/F from Previous Page				
A	**Power Point** comprising wiring drawn in 3x4.0mm2 PVC-SC-CU cables in concealed 25mm diameter HG PVC conduits in complete with all accessories but excluding the D.P switch.	5	Lm		
B	20A DP Control Switch marked 'As Per Application' with neon light and cord outlet for item above Clipsal or approved equivalent.	5	No.		
C	**Air Conditioner Power Point (1 phase)** comprising wiring drawn in 3x4.0mm2 PVC-SC-CU cables in concealed 25mm diameter HG PVC conduits in complete with all accessories but excluding the D.P switch.	8	No.		
D	20A DP Control Switch marked 'As Per Application' with neon light and cord outlet for item above Clipsal or approved equivalent.	8	No.		
E	**Toilet Extract Fan (1 phase)** comprising wiring drawn in 3x4.0mm2 PVC-SC-CU cables in concealed 25mm diameter HG PVC conduits in complete with all accessories but excluding the D.P switch.	2	No.		
F	20A DP Control Switch marked 'As Per Application' with neon light and cord outlet for item above Clipsal or approved equivalent.	2	No.		
G	**Undersink Water Heater's Power Point,** comprising wiring drawn in 3x4mm2 PVC-SC-CU cables in concealed 25mm Diameter HG PVC conduits in shower room complete with all accessories but excluding the D.P switch.	1	No.		
H	20A DP Control Switch marked 'As Per Application' with neon light and cord outlet for item above Clipsal or approved equivalent.	1	No.		
	DATA POINTS				
I	Data outlet point done in 25mm Dia. HG PVC conduits concealed in building fabric/ trunking complete with all necessary accessories.	10	No.		
	DISTRIBUTION BOARDS				
J	12Ways SPN+E, flush mounted Consumer Unit complete with 100A integral isolator as SCHNEIDER ELECTRIC or an approved equivalent complete with all accessories but excluding MCBs for the kitchen.	1	No.		
K	MCB's for item above as SCHNEIDER ELECTRIC or an approved equivalent				
	(i) 10A SP	1	No.		
	(ii) 20 A SP	3	No.		
	(iii) 32A SP	2	No.		
	(iv) 45A SP	1	No.		
	(v) TP Spareway blanking plates	5	No.		
L	Carry out concise permanent traffolyte labelling for all the sub-circuits in item above.	1	Item		
	SUB-MAIN POWER DISTRIBUTION				
M	3 core 16mm2 SWA/PVC/SC copper cables in 32mmØ concealed HG PVC conduits c/w all installation accessories	30	Lm.		
N	Cable glands and lugs for the above cables.	1	Item		
	Supply and deliver to the Project Electrical Engineer office the following stationery to be used in running the project:				
O	Photocopying paper white A4 80g/M^2 (carton)	2	No.		
P	HP Laserjet Printer as HP LaserJet Pro M402dne	1	No.		
Q	External Sandisk Extreme 1TB Portable USB-C SSD V2 (1050MB/s)	1	No.		
	TOTAL FOR BILL NO.2: ELECTRICAL WORKS - FIRST FLOOR C/F TO COLLECTION PAGE				

COLLECTION PAGE		
ITEM	**DESCRIPTION**	**AMOUNT (KSHS)**
1.00	TOTAL FOR BILL NO.1: PRELIMINARIES	
2.00	TOTAL FOR BILL NO.2: ELECTRICAL INSTALLATION WORKS	
	TOTAL FOR SCHEDULE NO.1:ELECTRICAL INSTALLATION WORKS C/F TO SUMMARY PAGE	

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD					
ELECTRICAL INSTALLATION WORKS					
SCHEDULE NO.2: IP-CCTV INSTALLATION WORKS --FIRST FLOOR					
Item	**Description**	**Qty**	**Unit**	**Rate (Kshs)**	**Amount (Kshs)**
	Supply, Install, Program, Test and Commission the following :-				
	IP-CCTV SURVEILLANCE SYSTEM CAMERAS				
A	4MP Smart Dual Light Vari-focal Dome WizSense Network Camera with Wall Mount Bracket as dahua or approved equivalent.	10	No.		
	ACTIVE COMPONENTS				
C	16 Port Edge Switch as Cisco Catalyst 4500 Series Complete with 2No. Power Supply, 10G uplink ports, POE or its equal and approved equivalent.	1	No.		
D	240V, 50Hz, 1000VA, Rack Mountable Double Conversion APC smart un-interrupted power supply unit (UPS) TRUE online INCLUDING Batteries with USB and Serial Port or an approved equivalent.	1	No.		
E	Power Distribution Units (PDU) 6/8 way Surge Protected /Triplite Voltage Regulator	1	No.		
	BACKBONE CABLING AND GENERAL REQUIREMENTS				
F	Multi Mode Fiber Optic 8 Core Cable (Armoured) for interlinking to Server Room complete with connectors to Active Components and all terminations to active equipment i.e., Floor Edge Switch.	100	Lm.		
G	24 Port Fibre Optic Patch Panel as dahua or its equal and approved equivalent.	2	No.		
H	SFP Fibre Modules as CISCO or approved equivalent.	2	No.		
I	SC-SC fibre Patch Cord.	2	No.		
	CABINETS				
I	24 Port UTP Patch Panel as dahua or its equal and approved equivalent C/W all the necessary accessories.	2	No.		
J	19" 1U Metal , Cable Manager (Organizer) as dahua or its equal and approved equivalent C/W all the necessary accessories.	2	No.		
K	Grounding and bounding kit complete with 50mm diameter copper bounding bar and 6mm thick green and yellow wire. The Earthing of the system is to be to the approval of the Engineer.	1	Lot		
	CABLING				
L	Cat 6A, UTP 4 Pair cable as dahua or its equal and approved equivalent.	720	Lm.		
M	1M, Cat 6A, UTP factory terminated Patch Cords as dahua or its equal and approved equivalent.	16	No.		
N	25mm Flexible Conduits	40	Lm.		
O	200mm x 50mm deep Deep Perfotrated GI cable tray complete with all accessories As Manufactured by Power Technics or approved equivalent.	50	Lm.		
	Sub-Total C/F to Next Page				

SCHEDULE NO.2: IP-CCTV INSTALLATION WORKS --FIRST FLOOR CONTINUED…..					
Item	**Description**	**Qty**	**Unit**	**Rate (Kshs)**	**Amount (Kshs)**
	Sub-Total B/F from Previous Page				
	STORAGE				
A	Dahua 32CH 4HDD 1.5U NETWORK VIDEO RECORDER.Supports Smart H.265+, H.265, Smart H.264+, H.264 and MJPEG decoding formats. Max. decoding capability: 32 × 1080p@30 fps. Max. 384/384/384 Mbps incoming/recording/outgoing bandwidth. Supports IP cameras with a resolution up to 32 MP. Supports AcuPick with up to 32 channels. Supports N+M cluster,iSCSI.	1	No.		
B	HDD-ST10000NM017B-10TB-256MB-7200RPM-3.5-inch-SATA	1	No.		
	MONITORING & SERVER				
C	CCTV dedicated Desktop Computer, Intel corei8, 64-bit, 8GB Video Graphics Card Processor/3.6GHz Quad-core/16GB System RAM/4TB SSD/DVD RW/ win10/21" Screen of Multi-Monitor Support complete with a printer as specified in particular specifications for central monitoring.	1	No.		
D	Central IP Video Surveillance Management Software for viewing and Recording live video of premises with support for multi-site / multi-client monitoring (for upto 2 No. client stations).	1	No.		
E	Dahua 55 inch Security Monitor tamper-proof metal housing, suitable for continuous 24/7 operation.178°H/178°V extra-wide viewing angle for overall viewing performance.High fidelity digital processing for a brilliant and vivid video.Includes abundant ports such as HDMI, DVI, VGA, CVBS, USB, and supports HDMI daisy chain.Built-in speakers and supports infrared remote control or approved equivalent.	1	No.		
	Supply and deliver to the Project Electrical Engineer's office the following stationery to be used in running the project:				
F	Photocopying paper white A4 80g/M^2 (carton)	2	No.		
G	Samsung Galaxy Z Fold 6 12/256GB c/w covers & light stylus pen	1	No.		
H	Letterhead quality paper as CONQUERER or equal and approved (carton)	1	Ream		
I	**Any other Item necessary for successful completion of this installation.** a) b) c) d)	1	Item		
	TOTAL FOR SCHEDULE NO.2: IP-CCTV INSTALLATION WORKS C/F TO SUMMARY PAGE				

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD					
SCHEDULE NO. 3: VISUAL & COMERCIAL DISPLAY INSTALLATION WORKS					
Item	**Description**	**Qty**	**Unit**	**Rate (Kshs)**	**Amount (Kshs)**
	A. VISUAL LED DISPLAY --SCREEN ROOM				
	Supply, Install & program, test and commission the following:				
A	65 inch dahua ULTRA HD 4K LED TV screen or approved equivalent complete with heavy duty steel floor stand, mounting brackets, high voltage guard and all installation accessories as described in the particular specification of this	1	No.		
B	Long Throw Projector Digital LED Multimedia Projector with 6000 Luminous Efficiency - Max 160" Screen Optical Keystone USB/AV/SD/HDMI/VGA Interface 6000 Lumens Digital Projector complete with , remote adjuctable lence, VGA,HDMI, LAN as Epson/Hitachi or approved equivalent and the mounting arm. HD/HDMI/VGA for connectivity with laptops and desktops as described in the particular specification of this document	1	No.		
C	Electric ceiling mount retractable projector lift for item B above as described in the particular specification of this document	1	No.		
D	Supply and Install Elite Screens or approved equivalent Spectrum,120-inch 16:9, 4K Theater Electric Motorized Drop Down Projection Projector Screen, as described in the particular specification of this document	1	No.		
E	Dual Pop-Up Table Mount Multi-Connection Unit (Black Anodized Aluminum Top)as KramerTBUS-202XL(B) or approved equivalent	2	No.		
F	Medium laser presenter pointer	1	No.		
G	Automatic Voltage Switcher 13A (AVS 13)	1	No.		
H	Cabling, Cords and Jacks	1	Item		
I	Any other items necessary to complete the installation satisfactorily. Please list and give quantity of the items i) ii) iii) iv)	1	Item		
	B. COMERCIAL DISPLAY-LCD DIGITAL SIGNAGE				
J	Dahua 65 inch Indoor Wall-mounted LCD Digital Signage. Designed with an industrial-grade panel. Includes a mainstream quad-core CPU, Android system, and decodes up to 4K resolution.Plays and releases programs in multiple modes.With intelligent split screen, its page layout can be freely adjusted, making it suitable for a variety of scenes.Designed with B/S architecture, the device manages programs by time and location, and generates operation reports.The device offers unified platform management, and can be remotely controlled by the platform as described in the particular specification of this document.	4	No.		
	TOTAL FOR SCHEDULE NO. 3:VISUAL & COMERCIAL INSTALLATION WORKS C/F TO SUMMARY PAGE				

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD					
SCHEDULE NO. 4: CREATIVE FLEXIBLE INDOOR RENTAL LED					
Item	**Description**	**Qty**	**Unit**	**Rate (Kshs)**	**Amount (Kshs)**
	THEATRE ROOM				
	Supply, Install & program, test and commission the following:				
	LED SCREEN CABINET				
A	Indoor Flexible rental cabinet P3.91, 500*500mm, rear service, Die-cast Magnesium frame, IP20 front amd IP 20 rear, 7680hz, brightness:1000 nits, 2 year wanrranty as dahua (DHI-PHRIA3.91-RF) or approved equivalent.	20	m2		
B	Hangging frame 0.5m	11	No.		
	LED SENDING BOX				
C	Supports common video input connectors, including 2xDVI, 2xHDMI 1.4, and 1x3G-SDI + loop, with 10xGigabit Ethernet ports and 2x10G optical fiber output connectors as dahua (VX1000 Pro) or approved equivalent.	1	Set		
D	**Led Module**-500*250mm Led module as additional for replacing failure ones.	16	Set		
E	**Power supply**-Built in power modules, for replacing failure ones	8	Set		
F	**Received Card**-Data receiving unit, built in each LED cabinets	8	Set		
G	**Flight case -** Flight case packing, 8 in 1	11	No.		
F	Any other Item necessary for successful completion of this installation. (Please Itemize) a) b) c) d)	1	Item		
	TOTAL FOR SCHEDULE NO. 4:CREATIVE FLEXIBLE INDOOR RENTAL LED C/F TO SUMMARY PAGE				

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE,NAIROBI CBD

ELECTRICAL INSTALLATION WORKS

SUMMARY PAGE

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.00	TOTAL FOR SCHEDULE NO.1: ELECTRICAL INSTALLATION WORKS	
2.00	TOTAL FOR SCHEDULE NO.2: IP-CCTV CAMERA INSTALLATION WORKS	
3.00	TOTAL FOR SCHEDULE NO.3: VISUAL & COMERCIAL DISPLAY INSTALLATION WORKS	
4.00	TOTAL FOR SCHEDULE NO.4: CREATIVE FLEXIBLE INDOOR RENTAL LED	
5.00	PROVISIONAL SUM FOR CONTINGENCY	**1,000,000.00**
	TOTAL FOR ELECTRICAL INSTALLATION WORKS C/F TO GRAND SUMMARY PAGE	

Total Amount in Words (Kenya Shillings) .....

.....

.....

Bidder's Name & Official Stamp

.....

.....

P.O. Box.....

Signature.....**Date**.....

PIN NO.....**V.A.T Certificate NO**.....

Witness.....**Address**.....

Signature of Witness.....**Date**.....

Statement of Compliance

a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.

b) I confirm I have not made and will not make any payment to any person, which can be perceived as an inducement to win this tender.

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

Date: .....

Official Rubber Stamp: .....

PROPOSED RENOVATION OF KFCB NAIROBI FILM CENTRE AT UCHUMI HOUSE- NAIROBI CBD.

SPECIFICATIONS AND BILLS OF QUANTITIES FOR SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF MECHANICAL FITTINGS, INTERNAL PLUMBING, INTERNAL DRAINAGE WORKS

CLIENT
THE CHIEF EXECUTIVE OFFICER
KENYA FILM CLASSIFICATION BOARD
P.O BOX 44226 - 00100
NAIROBI.

PROJECT MANAGER
WORKS SECRETARY
STATE DEPARTMENT FOR PUBLIC WORKS
P.O BOX 30743 - 00100
NAIROBI.

QUANTITY SURVEYOR
CHIEF QUANTITY SURVEYOR
STATE DEPARTMENT FOR PUBLIC WORKS
P.O BOX 30743 - 00100
NAIROBI.

ARCHITECT
CHIEF ARCHITECT
STATE DEPARTMENT FOR PUBLIC WORKS
P.O BOX 30743 - 00100
NAIROBI.

STRUCTURAL ENGINEER
CHIEF ENGINEER (STRUCTURAL)
STATE DEPARTMENT FOR PUBLIC WORKS
P.O BOX 30743 - 00100
NAIROBI.

ELECTRICAL ENGINEER
CHIEF ENGINEER ELECTRICAL
STATE DEPARTMENT FOR PUBLIC WORKS
P.O BOX 30743- 00100
NAIROBI.

MECHANICAL ENGINEER
CHIEF ENGINEER MECHANICAL (BS)
STATE DEPARTMENT FOR PUBLIC WORKS
P.O BOX 30743- 00100,
NAIROBI.

MAY, 2026

TABLE OF CONTENTS

PART 1: TENDERING PROCEDURES

TENDER EVALUATION CRITERIA

Note: The tenderer who shall be domestic subcontractor to the Main Contractor upon award of the tender, must comply with the following conditions and instructions failure to which the tender shall be rejected.

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

1. Preliminary Evaluation;
2. Technical Evaluation;

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 National Construction Authority Registration certificate (NCA 8 and above in Mechanical Engineering Services – Plumbing and Drainage);
iii) NCA current annual practicing license,
iv) Valid Tax Compliance Certificate;
v) Dully filled (in ink) Bills of quantities in the format provided, signed and stamped Summary Page
vi) Sign and Stamp

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 bidder will be required to submit relevant technical brochure/catalogues with the tender document, highlighting (using a mark-pen or highlighter) the Catalogue Number/Model of the proposed items. Such brochure/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) Any other necessary requirements so as to comply with the bid technical specifications.

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 Schedule specifications shall be **non-Responsive** while those meeting all the key technical specifications shall be **Responsive** **(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's and items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/ Equipment they propose to supply.

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

A) Assessment for eligibility

At this stage technical evaluation shall be done by comparing each tender to the technical requirements in the tender document

TABLE 1: Assessment for Eligibility

Item	Description					YES/NO
1.	**Compliance with Technical Specifications** *(Note: Tender Evaluation Committee to assess the bidder's compliance with Technical Specifications as per the table below)*					
	Item	Filled Technical Schedule Y/N	Attached Relevant Catalogue Y/N	Highlighted Relevant Model Y/N	Highlighted Model Meets Specifications Y/N	
	CPVC Pipe Work					
	Split Ac Unit (24,000 BTU/HR)					
	Hand Drier					
	Gate Valves					
	Water Closet					
	QUALIFIED YES / NO					

Non compliance with the Technical Evaluation will render the Tenderer Non responsive and therefore unqualified for further evaluation:

PART II - WORKS REQUIREMENTS

GENERAL MECHANICAL SPECIFICATIONS

SECTION B

GENERAL MECHANICAL SPECIFICATION

GENERAL MECHANICAL SPECIFICATION

2.01 General

This section specifies the general requirement for plant, equipment and materials forming part of the Sub-contract Works and shall apply except where specifically stated elsewhere in the Specification or on the Contract Drawings.

2.02 Quality of Materials

All plant, equipment and materials supplied as part of the Sub-contract Works shall be new and of first-class commercial quality, shall be free from defects and imperfections and where indicated shall be of grades and classifications designated herein.

All products or materials not manufactured by the Sub-contractor shall be products of reputable manufacturers and so far as the provisions of the Specification is concerned shall be as if they had been manufactured by the Sub-contractor.

Materials and apparatus required for the complete installation as called for by the Specification and Contract Drawings shall be supplied by the Sub-contractor unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connection by the Sub-contractor shall be carefully examined on receipt. Should any defects be noted, the Sub-contractor shall immediately notify the Engineer.

Defective equipment or that damaged in the course of installation or tests shall be replaced as required to the approval of the Engineer.

2.03 Regulations and Standards

The Sub-contract Works shall comply with the current editions of the following:

a) The Kenya Government Regulations.

a) The United Kingdom Institution of Electrical Engineers (IEE) Regulations for the Electrical Equipment of Buildings.

b) The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guides.

c) British Standard and Codes of Practice as published by the British Standards Institution (BSI)

e) The Local Council By-laws.

f) The Electricity Supply Authority By-laws.

g) Local Authority By-laws.

h) The Kenya Building Code Regulations.

i) The Kenya Bureau of Standards

2.04 Electrical Requirements

Plant and equipment supplied under this Sub-contract shall be complete with all necessary motor starters, control boards, and other control apparatus. Where control panels incorporating several starters are supplied, they shall be complete with a main isolator.

The supply power up to and including local isolators shall be provided and installed by the Electrical Sub-contractor. All other wiring and connections to equipment shall form part of this Sub-contract and be the responsibility of the Sub-contractor.

The Sub-contractor shall supply three copies of all schematic, cabling and wiring diagrams for the Engineer's approval.

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting currents described in the Kenya Power and Lighting Company (KPLC) By-laws.

All electrical plant and equipment supplied by the Sub-contractor shall be rated for the supply voltage and frequency obtained in Kenya, that is 415 Volts, 50Hz, 3-Phase or 240Volts, 50Hz, 1-phase.

Any equipment that is not rated for the above voltages and frequencies shall be rejected by the Engineer.

2.05 Transport and Storage

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimize the possibility of damage and to prevent corrosion or other deterioration.

On arrival at site all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

Adequate measures shall be taken by the Sub-contractor to ensure that plant and equipment do not suffer any deterioration during storage.

Prior to installation all piping and equipment shall be thoroughly cleaned.

If, in the opinion of the Engineer any equipment has deteriorated or been damaged to such an extent that it is not suitable for installation, the Sub-contractor shall replace this equipment at his own cost.

2.06 Site Supervision

The Sub-contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

2.07 Installation

Installation of all special plant and equipment shall be carried out by the Sub-contractor

under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 2.03 of this Section.

2.08 **Testing**

2.08.1 General

The Sub-contractor's attention is drawn to Part 'C' Clause 1.38 of the "Preliminaries and General Conditions".

2.08.2 Material Tests

All material for plant and equipment to be installed under this Sub-contract shall be tested, unless otherwise directed, in accordance with the relevant B.S Specification concerned.

For materials where no B.S. Specification exists, tests are to be made in accordance with the best modern commercial methods to the approval of the Engineer, having regard to the particular type of the materials concerned.

The Sub-contractor shall prepare specimens and performance tests and analyses to demonstrate conformance of the various materials with the applicable standards.

If stock material, which has not been specially manufactured for the plant and equipment specified is used, then the Sub-contractor shall submit satisfactory evidence to the Engineer that such materials conform to the requirements stated herein in which case tests of material may be partially or completely waived.

Certified mill test reports of plates, piping and other materials shall be deemed acceptable.

2.08.3 Manufactured Plant and Equipment – Work Tests

The rights of the Engineer relating to the inspection, examination and testing of plant and equipment during manufacture shall be applicable to the Insurance Companies or Inspection Authorities so nominated by the Engineer.

The Sub-contractor shall give two weeks' notice to the Engineer of the manufacturer's intention to carry out such tests and inspections.

The Engineer or his representative shall be entitled to witness such tests and inspections. The cost of such tests and inspections shall be borne by the Sub-contractor.

Six copies of all test and inspection certificates and performance graphs shall be submitted to the Engineer for his approval as soon as possible after the completion of such tests and inspections.

Plant and equipment which is shipped before the relevant test certificate has been approved by the Engineer shall be shipped at the Sub-contractor's own risk and should

the test and inspection certificates not be approved; new tests may be ordered by the Engineer at the Sub-contractor's expense.

2.08.4 Pressure Testing

All pipe work 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 pipe work 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.

2.08.5 Shop drawings

Before manufacture or Fabrication is commenced the contractor shall submit Two copies of detailed drawings of all water tanks, fire hose reel pump, water booster pump and any other equipment 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 contractor of the full responsibility of errors or the necessity of checking the drawings himself or of furnishing the materials and equipment and performing the work required by the plans and specifications.

2.09 Colour Coding

Unless stated otherwise in the Particular Specification all pipe work shall be color 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 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.

C: PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

C: PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

GENERAL

SITE LOCATION

The site of the proposed works is at **Kenya Film Classification Board, Nairobi – Nairobi County**

SCOPE OF WORKS

The works to be carried out under this sub-contract comprise Supply, installation, testing and commissioning of the following: -

a) **Plumbing and Drainage Installation works**

BROCHURES FOR DEVICES

For consideration and qualification tenderers shall, at their own cost, provide colored manufacturer's brochures detailing technical literature and specifications where applicable

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:

i. **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.

ii. **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.

iii. CPVC piping

PVC (polyvinyl chloride) that has been chlorinated via a free radical chlorination reaction. CPVC is produced by adding chlorine to PVC in a water slurry or fluidized bed chlorination process. The chlorination reaction is initiated by ultraviolet light. The chlorinated PVC is compounded with ingredients necessary for the desired properties for further processing. The chlorine added to PVC gives CPVC higher temperature performance and improved fire and corrosion resistance.

Should conform to ASTM D2846 standard and ASTM F441 Standard for chlorinated poly vinyl chloride pipes.

Short copper connection tubes between galvanized pipe work and sanitary fitments shall not be used because of the risk of galvanic action.

If, as may occur in certain circumstances, it is not possible to make the connection in any way than the use of copper tubing, then a brass straight connector shall be positioned between the galvanized pipe and the copper tube in order to prevent direct contact.

b) 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.

c) 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-meter centers.
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 Littleshampton, 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 builder's work associated with the pipe support installation.

The Sub-contractor shall submit all his proposals for pipe supports to the Engineer for approval before any erection works commence.

b) Steel and Copper Pipes and Tubes

Pipe runs shall be secured by clips connected to pipe angers, wall brackets, or trapeze type supports. 'U' bolts shall not be used as a substitute for pipe clips without the prior approval of the Engineer. An approximate guide to the maximum permissible supports spacing in meters 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. They shall be as described in the bill of quantities.

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 b e 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.

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 galvanized 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 ten hours 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:

- Apply a coating of suitable filler until the canvas weave disappears and allow to dry.
- 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 aluminum foil finish banded in colours to be approved by the Engineer.

In all respects, unless otherwise stated, the hot and cold-water installation shall be carried out in accordance with the best standard of modern practice and described in C.P.342 and C.P.310 respectively to the approval of the Engineer.

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains of large diameter, by a power-driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded.

Pressure gauges should be recalibrated before the tests.

The Sub-contractor shall be deemed to have included in his price for all test pumps, and other equipment required under this specification.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. specification designates a maximum test pressure.

3.5: STERILISATION OF COLD-WATER SYSTEM

All water distribution system shall be thoroughly sterilized and flushed out after the completion of all tests and before being fully commissioned for handover.

The sterilization 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.

PARTICULAR S P E C I F I C A T I O N

FOR

AIR CONDITIONING INSTALLATIONS

PARTICULAR SPECIFICATIONS

CLAUSE No. DESCRIPTION PAGE

PARTICULAR SPECIFICATIONS FOR AIR CONDITIONING SYSTEMS

SCOPE OF WORKS

The works to be carried out comprises of the Supply, Delivery, Installation, setting to work, Testing and commissioning of all materials and equipment called for in this specification and/or shown in the contract drawings.

The tenderer shall include for all appurtenances and appliances not particularly called for in this specification or on the contract drawings, but which are necessary for the completion and satisfactory functioning of the system.

No claim for extra payment shall be accepted from the contractor for non-compliance with the above requirements.

If in the opinion of the tenderer there exists difference between the specification and the contract drawings, the tenderer shall clarify the difference with the engineer before tendering. The Works to be installed under the contract shall comply with the State Department for Public Works requirements for contract works under "GENERAL MECHANICAL SPECIFICATION".

CLIMATIC CONDITIONS

The following climatic conditions apply at the sites of the works and all materials and equipment used shall be suitable for these conditions: -

PARAMETERS	(CONDITIONS) KILGORIS TOWN
Maximum mean outdoor dry bulb Temperature, to	28°C
Minimum Temperature	11.5°C
Relative Humidity	42% - 94%
Altitude	1789m
Longitude	34° 8790' E
Latitude	1. ° 0063' S
Max. solar radiation occurs during the month of February.	

SYSTEMS DESIGN DATA

The air-conditioning systems are designed to maintain the following internal conditions with ambient conditions of 28ºC DB and 55% RH

Internal Temperature: 23 ± 1ºC

Relative Humidity: 50± 10%

The equipment described here under covers the specific requirements of equipment to be used for this contractor work and shall be used in conjunction with the accompanying contract drawings.

It shall be deemed that the tenderer has based his tender on plant and equipment which is equal in performance to that stated within the specification.

SPLIT AIR CONDITIONING SYSTEM

This shall be installed in the

The system shall be complete with.

Indoor wall mounted cooling unit (Evaporator)

Each coil unit shall consist of a cooling coil, air circulating fan, fan-guard, and a thermostatic expansion valve. A timer unit shall be mounted in the control panel to both the de-frosting intervals and defrosting periods, both of which shall be variable.

The evaporator unit shall be of capacity as specified under the specified conditions, and shall be of the dry expansion type, and preferably of similar make as that of the condensing units. The unit shall be cassette type, high wall mounted, or ceiling mounted as will be specified by the Engineer. The coil shall be manufactured from seamless copper tubing with aluminum fins mechanically bonded to the tubes.

The panel shall be interlocked such, that on energizing the heater, the compressor, condenser and evaporator fan shall be de-energized and only re-energized when the heater is switched off by a evaporator mounted thermostat. A manual overriding switch shall by-pass the timer switch.

The air-circulating fan shall be manufactured from rigid aluminum sheet and finished in white casing. A drip tray with 25mm diameter connections shall be incorporated in the base of the casing. The Unit shall be complete with the following:

- 1 No. air purifying filter.
- Built in drain pump to automatically drain water.
- Refrigeration pipe work with flared connections
- Fixing brackets/wall mounting kit/ground mounting kit
- Thermostat to control room temperature
- High- and low-pressure units
- Condensate discharge pipe work in Black PVC, 15mm diameter
- Service access valves.
- Voltage Surge Protector

The system shall be suitable for 240V, 1 – Phase, 50Hz power supply.

The split air-conditioning system shall be designed to maintain room inside temperature of 23±1º C and relative humidity of 50±10%.

Outdoor Units.

The outdoor units shall be installed and mounted on the wall using appropriate and approved mounting brackets. They shall be complete with hermetically sealed compressors. Safety devices shall include overload/surge protection among others.

The unit shall be connected to power provided by others. It shall also be connected to refrigerant piping and control wiring. It shall have adequate charge of refrigerator oil and R 410 A refrigerant. The air conditioning units shall be as York or approved equivalent and shall be provided with approved mounting brackets.

The Unit shall be complete with the following:

- Casing constructed of 18-gauge zinc coated mild steel, zinc phosphate bonderized, coated with oven baked polyester paint and weatherized for outdoor installation. It shall have weep holes on base to allow ease of drainage.
- Hermetically sealed compressor mounted to unit base with rubber isolated hold down bolts, uniform in oil & pressures and shall have internal overload protection.
- Refrigeration pipe work with flared connections
- Distributor with refrigeration control
- Fixing brackets/wall mounting kit/ceiling mounting kit
- Heat exchanger capacity controls.
- Precise inverter frequency controls
- New oil returning system (refrigerant oil control system)
- High- and low-pressure units
- An innovation of installation with automatic address settings for indoor units with twin multiplex transmission system of no polarity.
- Condensate discharge pipe work
- Service access valves.
- Voltage Surge Protector

Refrigeration Piping

Refrigerant pipe work shall be approved copper tubing and fittings and shall be properly sized in conformity with the system manufacturer specifications. Pipework shall be joined together by soldering/brazing and shall be complete with all necessary joints, reducers, and accessories.

The Ozone friendly refrigerant flow shall be controlled with either a capillary tube or thermostatic expansion valve. Installation shall be carried out by competent and qualified craftsmen. The Engineer may demand proof of qualifications and experience in installation of refrigeration systems.

Pipe work shall be tested for leaks after installation to the Engineers satisfaction. It shall be properly anchored, insulated and no vibration of pipes shall be allowed during the running of the systems. An electronic leak detector shall be used to test for leaks.

Testing and Commissioning Standards

The system shall be balanced to the satisfaction of the project engineer. It shall be run under complete automatic controls 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 a further test or tests of 72 hours' duration shall be carried out to ensure satisfactory operation, all at the expenses of the contractor. All accessories/equipment have to tested for capacity, efficiency, leakages, and other human errors and shall meet standards and specifications.

As-Built-Drawings and maintenance manuals

Once the air conditioning system has been tested and commissioned, drawings and maintenance manuals shall be provided. They shall be a true and accurate representation of what has been commissioned.

Training

Adequate personnel shall be trained to perform normal operations and routine maintenance of the air conditioning system. The number of personnel to be trained shall be specified for particular pool.

TESTING & COMMISSIONING

All the pipe work and connections herein described shall be tested in the presence of the Engineer and to the hydraulic pressure the Engineer deems satisfactory and for a minimum period of 1 hour. These tests must be before any insulation work is undertaken or any pipe work is finally enclosed in any ducts, etc. and due allowance is to be made in the tender for these tests.

The tenderer is to include for providing for all the testing equipment, temporary plugging and refilling etc.

ELECTRICAL WORKS

The tenderer shall include for supply, installation and commissioning of all starters, control apparatus, control panels and interconnecting wiring and conduits for equipment that the tenderer is supplying.

Power points shall be provided within 5 meters of the equipment installation point and the tenderer shall connect his

equipment from this point.

BUILDERS WORKS

The tenderers shall allow for perforation of holes, hacking of walls etc. All disturbed surfaces shall thereafter be made good by the tenderer upon satisfactory completion of the works.

BILLS OF QUANTITIES

STATEMENT OF COMPLIANCE

a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.

b) I confirm I have not made and will not make any payment to any person, which can be perceived as an inducement to win this tender.

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

Date: ……...

Official Rubber Stamp: ……..……

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

1. These Notes for Preparing a Bill of Quantities are intended only as information for the Procuring Entity or the person drafting the Tender Documents. Priced Bills of Quantities shall be part and parcel of the Contract Documents.

2. The objectives and purpose of the Bills of Quantities are to provide sufficient information on the specifications, descriptions and quantities of Works to be performed to enable tenders to be prepared efficiently and accurately and when a contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed. In order to attain these objectives, Works should be itemized in the Bill of Quantities insufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and clear as possible.

3. NOTES TO PREPARING PREAMBLES

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

4.4. The rates and prices tender in the priced Bills of Quantities shall, except in so far as it is otherwise provided under the Contract, include all Constructional Plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.

4.5. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.

4.6. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bills of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.

4.7. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bills of Quantities. References to the relevant sections of the Contract documents shall be made before entering prices against each item in the priced Bills of Quantities.

4.9 Provisional Sums and contingency sums included and so designated in the Bills of Quantities shall be expended in whole or in part at the direction and discretion of the Architect in accordance with Sub-Clause13.5 and Clause 13.6 of the General Conditions of contract.

4.10 In preparing the Bills of Quantities, notes should be removed as they are intended to guide the person preparing the Tender Documents. The Contractor must allow in his

rates for any costs associated with and complying with the requirements in the Preambles.

4.11 Should a tenderer/contractor not price any item in any section of the Bills of Quantities including Preliminary items, it will be assumed that he/she has spread its cost in other areas that he/she will have priced. Therefore, the item or items will be executed without any additional costs or without being treated like variations.

4. NOTES ON PREPARING BILLS OF QUANTITIES

5.1 The Preliminary Items should be limited to tangible items that should be priced by the tenderer, are identifiable and can be priced separately and included in the interim valuations precisely. Such items may include such items as site office, notice boards, and other temporary works, otherwise items such as security for the Works which are primarily part of the Contractor's obligations should be included in the Contractor's rates.

5.2 The work items in the Bills of Quantities should be grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing, or any other special characteristics may give rise to different methods of construction, or phasing of the Works, or considerations of cost. Such groups could be ground excavations, structures, external works, services, etc. General items common to all parts of the Works may be grouped as a separate section in the Bill of Quantities.

5.3 Quantities should be computed net from the Drawings, unless directed otherwise in the Contract, and no allowance should be made for bulking, shrinkage or waste. Quantities should be rounded up where appropriate.

5.4 Where the measured items a redeemed not to be exact because of the likelihood that the scope can change during the execution of the works, such items could be subject to re-measurement, the word **"provisional"** should be used to identify such cases. Where whole sections of the work items fall in this class, for example foundations, they should be labelled "Provisional Quantities" or "Provisional Items" so that the Tenderer/Contractor is advised up front that such items are subject to re-measurement to done before such work is cover-up.

5.5 All items that have not been measured and therefore not subject to tenders pricing should be listed in the Bills of Quantities as **Provisional Sums** for particular item or class of Work, which may be subject to a nominated subcontract or separate measurements at a later date during the execution of the works. For example, if it is deemed not possible to measure electrical works before going to tender because detail designs are not ready, a provisional sum can be allowed in the Bills of Quantities for "Installation of Electrical Works" to be executed later when actual design details are completed. To the extent not covered above, there should be in the Bills of Quantities a general provision for physical and financial contingencies made as a "Provisional Sum for Contingencies" and "Provisional Sum for Fluctuations".

PREAMBLES

1. The method of measurement of completed work for payment shall be in accordance with *The Standard Method of Measurements for Building Works and Associated Civil Works for Eastern Africa (2nd edition) of 2008 prepared by The Architectural Association of Kenya (Quantity Surveyors Chapter)*

2. The Site is situated in **Kenya Film Classification Board, Nairobi – Nairobi County.** It is approximately **within Central Business District**. Access to the site shall be through **Moi Avenue.** Which is an existing public road. Any damage caused to the surfaces of this road shall be made good at the Contractor's expense. The Contractor shall visit the site and acquaint itself with its nature and position, the nature of the ground, substrata and other local conditions, positions of existing power, water and other services, access roads or any other limitations that might affect his cost or progress. No claim for extras shall be considered on account of lack of knowledge in this respect.

3. The Contractor shall obtain the Architect's approval on the siting of all temporary buildings, spoil heaps, temporary access path, and storage of materials. The Contractor shall also obtain the Architect approval and direction regarding the use of any materials found on the Site.

4. The drawings used in the preparation of these Bills of Quantities can be inspected at the offices of the Procuring Entity or Procuring Entity's Representative during normal working hours. Two sets of the Working Drawings shall be provided to the contractor but additional copies shall be provided at a cost to be determined by the Engineer.

5. The Contractor shall allow for the payment of all bank charges in connection with the procurement of Bank Guarantees and stamp charges in connection with this contract Agreement.

6. The Contractor shall carry out the various sections of the Works in such an order as the Architect May direct. The Procuring Entity reserves the right to occupy the Works by sections on completion provided that such occupation is considered to be both practical and reasonable and will not interfere with the Works. The Contractor shall allow any costs associated with such occupation.

7. The main Contractor will be fully responsible for paying his Sub-Contractor but the Procuring Entity reserves the right in very exceptional circumstances to make such payments direct in the interests of the project where the completion thereof might be jeopardized by any dispute or vicariousness between the Contractor and the Sub-Contractor involve.

8. The Contractor shall complete and deliver the Works in the period inserted in the Form of Tender as his time for completion of the Works from the date for Possession, to be agreed with the Engineer. The Contract Period is presumed to have been calculated making due allowance for seasonal inclement weather conditions. No claim for extension of time due to the normal inclement weather for this area shall be entertained.

9. The Contractor shall, upon receiving instructions to proceed with the Works, draw up a Programme and Progress Chart setting out the order in which the Works are to be carried out, with the appropriate dates thereof. This Chart shall be agreed with the

Architect and no deviation from the order set out in it will be permitted without the written consent of the Engineer. The Contractor will be responsible for arranging the above programme with all his sub-Contractors and Specialties. The Contractor shall allow in his rates for carrying out this exercise, and for updating it as required.

10. The Contractor shall submit to the Architect on the first day of each week or such longer period as the Architect from time to time direct, a Progress Report and any information for the proceeding period, showing the progress during the period and the up-to-date cumulative progress on all important items of each section or portion of the Works.

11. The Contractor shall arrange for photographs of the Site to be taken by a professional photographer approved by the Engineer. The Photographs shall provide a record of the Site and adjacent are as prior to the commencement of the Works and shall cover such portion of the works in progress and completion as the Architect shall direct. All prints shall be full plate size, unmounted, and marked on the reverse side with the date of exposure, identification reference and brief description. The copyright of all photographs shall be vested in the Procuring Entity. The negatives and four prints from each negative shall be delivered to the Architect within two weeks of exposure.

12. Figured dimensions are to be followed in preference to dimensions scaled from the Drawings, but whenever possible dimensions are to be taken on the Site or from the buildings. Before any work is commenced by Sub- Contractors or Specialist Firms, dimensions must be checked on the site comparable dimensions shown on the drawings. The Contractor shall be responsible for the accuracy of such dimensions.

13. Prior to commencement of any work the Contractor is to ascertain from the relevant Authorities the exact position, depth and level of all existing electric cables, water pipes or other services in the area and he shall make whatever provisions may be required by the Authorities concerned for the support and protection of such services. Any damage or disturbance caused to any services shall be reported immediately to the Architect and the relevant Authority and shall be made good to their satisfaction at the Contractor's expense. Where appropriate the Contractor shall open up the ground in advance of the main work by hand digging, if necessary, to locate precisely the position and details of the services which are likely to affect his operations.

14. The Contractor shall include in his prices for the transport of materials, workmen, etc./, to and from the site of the proposed works, at such hours and by such route as are permitted by the Authorities.

15. The Contractor will be required to make good, at his own expense and damage he may cause to the present road surface and pavements within or beyond the boundary of the Site, during the period of the works. All existing paths, storm water channels, etc., that may be destroyed or damaged during the progress of the Works shall be reinstated by the Contractor to the satisfaction of the Engineer.

16. The Contractor is to allow for complying with all instructions and regulations of the Police Authorities.

17. All water shall be fresh, clean and pure, free from earthly, vegetable or organic matter, acid or alkaline substance in solution. The Contractor shall provide at his own risk and cost all water for use in connection with the Works, (including works of subcontractors). If need be, he shall make arrangements with the Local Water Authority for

the installation of a separate meter for all water used by him throughout the Contract and pay all cost and fees in connection therewith. He shall also provide temporary storage tanks and tubing, etc., as may be necessary, and clear away at completion.

18. The Contractor shall provide all artificial lighting and power for his own use on the Works, (including Sub – Contractor's) including all temporary connections, wiring, fittings, etc., and clearing away on completion. The Contractor shall pay all fees and obtain all permits in connection there with.

19. The Contractor shall constantly keep on the Works a Literate English-speaking Agent or Representative, competent and experienced in the kind of work involved, who shall give his whole time to the superintendence of the works. (Including works of sub –contractors). Such Agent or Representative shall receive on behalf of the Contractor directions and instruction from the Engineer, and such directions and instructions shall be deemed to be given to the contractor in accordance with the Conditions of Contract. The Agent shall not be replaced without the specific approval of the Engineer.

20. The Contractor shall ensure that the safety of his work people and all authorized visitors to the site are protected at all times. In particular, there shall be the proper provision of guard–rails to scaffolding, protection against falling materials, tools on site, dust, nail and other sharp objects. The site shall be kept tidy and clear of dangerous rubbish. The Architect shall be empowered to suspend work on site should it be considered this condition is not being observed and no claim arising from such suspension will be allowed.

21. They are as available to the Contractor for work yards, offices and other facilities shall be directed by the Architect and any existing features to remain shall be protected from damage throughout the Contract Period and handed back in good condition when they are vacated at the end of the Contract. If additional areas are required, the contractor shall source then at own cost.

22. The Contractor shall give the Architect reasonable notice of the intention to set out or take levels for any part of the Works so that arrangements may be made for checking the work. The accuracy of setting out and leveling shall be within the tolerances specified in the Specifications or on the Drawings. The checking of setting out or leveling by the Architect shall not relieve the Contractor of his duties or responsibilities under the Contract.

23. The Contractor must take steps necessary to safe guard and shall beheld fully responsible for any damage caused to existing and adjacent property, including buildings that are not a subject of demolition. He shall make good at his own cost damage to persons and property caused there on, and he shall indemnify the Procuring Entity against any loss or claim that may arise.

24. The Contractor shall take such steps and exercise such care and diligence as to minimize nuisance arising from dust, noise or any other cause to the occupiers of the existing and adjacent property. He must provide such temporary and special screens and tarpaulins or gummy bags, hoarding, barriers, warning signs etc. as he considers necessary and sufficient for the protection of the existing and adjacent property and or prevention of nuisance etc. as directed by Engineer.

25. The Contractors attention is drawn to the standards levy order which was amended on 15thOctober 1998. Legal notice No.154 of 1998. The Contractor is required to pay a

monthly level of 0.2% of his factory price of construction works with effect from January 1999. Tenderer shall allow for this in the build-up his rates.

26. The Contractor shall provide temporary sheds, offices mess rooms, sanitary, accommodation and other temporary buildings for the use of the contractor and sub-contractors, including lighting furniture equipment and attendance.

27. Contractor shall provide/build labor camp sat areas to be agreed with the Engineer. Labor camps shall be complete with sanitary accommodation and fencing gates.

28. The Contractor must provide the necessary toilet facilities to the requirement and satisfaction of the Health Authorities and maintain the same in a thoroughly clean and sanitary condition and pay all conservancy fees during the period of the Works and remove when no longer required.

29. The Contractor shall provide at his own risk and cost all watching and lighting as necessary to safeguard the Works, Plant and materials against damage and theft.

30. The Contractor shall provide all necessary hoists, tackle, plant, equipment, vehicles, tools and appliances of every description for the due and satisfactory completion of the Works and shall remove the same on completion. All such plant, tools and equipment shall comply with all regulations in force throughout the period of the Contract and shall be altered or adopted during the Contract period as may be necessary to comply with any amendments in or additions to such regulations.

31. Provide, erect and maintain all necessary scaffolding, sufficiently strong and efficient for the due performance of the works, including Sub-Contract Works, provide special scaffolding as required by Sub-Contractors, alter and adopt all scaffolding as and when required during the Works, and remove on completion. No scaffolding is measured here in after and the Contractor must allow in his rates for this.

32. The Contractor shall take all necessary precautions such as temporary fencing, hoarding fans, planked footways, guard–rails gantries screen, etc., for the safe custody of the Works, materials and public protection and adjacent properties.

33. Cover up all and protect from damage, including damage from inclement weather, all finished work and unfixed materials, including that of Sub-Contractors, etc., to the satisfaction of the Architect until the completion of the Contract.

34. The Contractor shall, after completion of the works, at his own expense, remove and clear away all surplus excavated demolition materials, plant, rubbish and unused materials and shall leave the whole of the Site and Works in a clean and tidy state to the satisfaction of the Engineer, sheds, camps, etc. Particular care shall be taken to leave clean all floors and windows and tore move all paint and cement all rubbish and dirt as it accumulates. The Contractor is to find his own dump and shall pay all charges in connection there with.

35. Concrete test cubes shall be prepared in a set of three, as described including testing fees, labor and materials, making molds, transport, handling, etc. Allow in your rates for making at least four cubes on each occasion, from different batches; the concrete being taken from the point of deposit.

36. The Contractors shall furnish at the earliest possible opportunity before work commences, and at his own cost, any samples of materials and workmanship that may

be called for by the Architect for the approval or rejection, and any further samples in the case of rejection, until such samples are approved by the Engineer. Such samples, when approved, shall be the minimum standard for the work to which they apply. The procedure for submitting samples of materials for testing or approval and the method of marking for identification shall be as laid down by the Engineer. The Contractor shall allow in his Tender for such samples and tests, including those in connection with his Sub-Contractors work.

37. The Contractors attention is drawn to the Finance Bill of the year 2000/2001 on withholding tax on contractual payment section 35(7)(i)(ii) which became effective on 1st July 2000. A 3% withholding tax will be applicable to all interim payments exceeding Kshs…….....……. for work done in respect of building or civil works. The contractor shall allow for any costs arising resulting there from in the build-up of rates.

38. Blasting will only be allowed with the express permission of the Architect in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost, in accordance with any Government regulations in force for the time being, and any special regulations laid down by the Architect governing the use and storage of explosives.

39. The National Construction Authority is a state corporation established under the national construction authority Act No.14 of 2011. The broad Mandate of the Authority is to oversee the construction industry and coordinate its development. The National Construction Authority Regulations 2014 with an effective date of 6thJune 2014, regulation 25, - Allow 0.5% of the tender sum/contract sum for construction levy.

40. The Contractor attention is drawn to Finance Bill of 1993 where VAT was introduced in all contracts for construction services. The tenderer is also drawn to VAT Act Cap 476 clause 19(9). The tenderer must allow for VAT 1.19 as instructed elsewhere.

41. The contractor shall allow and pay for all insurance to cover risks and indemnities required Items 17 and 18 of the Conditions of contract and also specified in the Special Conditions of Contract.

BILLS No. 1: KFCB MECHANICAL WORKS-CINEMA HALL AND OFFICES

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	SANITARY APPLIANCES				
	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. (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.				
	Water Closet (WC) Suite				
A	(i) Close-coupled WC suite with '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 flush button and heavy plastic seat and cover with metal top fixed (chrome plated) hinges. All to be as Duravit D-Code (Horizontal outlet) CAT No. 2111090000 water closet or equal and approved.	1	No.		
B	Wall-hung water closet suite in white colour complete with horizontal outlet to BS 3402 with 120mm deep 6-litre concealed cistern with dual fix frame and fittings including siphon as Geberit , 15mm diameter side inlet ball valves, 20mm diameter side overflow, plastic flush bend, inlet connection, dual-flush system with push flush plate and heavy plastic seat and cover with chrome plated hinges. To be as "WC DURAVIT DURAPLUS MODEL: 254709" or approved equivalent.	0	No.		
	Wash hand basin (WHB)-Pedestal				
C	Pedestal wash hand basin size 650 x 500mm with one tap hole, 32mm diameter chrome plated waste, pedestal, chrome plated sensor opperated pillar tap and heavy-duty plastic bottle trap (32mm 'P' trap) with 75mm seal. To be as Duravit D-Code CAT No. 0863270000 or equal and approved.	1	No.		
	Wash hand basin (WHB)-Counter Top				
D	Countertop wash hand basin size 545 x 425mm with one tap hole, 32mm diameter chrome plated chain waste, chain stay hole, chrome plated non-conculsive time delay press action pillar tap as Cobra model and heavy duty chrome plated bottle trap (32mm 'P' trap) with 75mm seal. To be of Duravit D-Code CAT No. 0337540000 countertops washhand basin or equal and approved.	0	No		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Toilet Roll Holder				
A	Fully recessed toilet roll holder in Vitreous China of size 165 x 165mm in approved colour as **Twyfords** or equal and approved.	1	No.		
B	Chrome plated toilet roll holder, the roll holder hook to be 165mm in length as Grohe Atro accessories Cat. No. 40 313 or equal and approved.	0	No.		
	Toilet Brush and Holder				
C	Wall mounted toilet brush holder and brush of approved colour as Ideal Standard or approved equivalent.	1	No.		
	Mirror				
D	6mm thick polished plate glass silver backed mirror with bevelled edges, size 610 x 610mm, Plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	1	No.		
E	6mm thick polished plate glass silver backed mirror with bevelled edges, size 1200 x 610mm, plugged and screwed to wall with 4No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	0	No		
	Soap Dispenser				
F	(i) Wall mounted soap dispenser with a capacity of about one litre having a press action soap release mechanism complete with fixing screws. Allow for initial soap supply. To be as Starmix or approved equivalent.	1	No.		
G	(ii) Wall mounted soap dispenser with a capacity of about one litre sensor operating soap release action complete with fixing screws. Allow for initial soap supply. To be as Starmix or approved equivalent.	0	No.		
	Hand Driers				
H	Automatic hand drier in white colour, operating on an infra-red automatic sensing system with heating element safety cut-out complete with a 30 seconds safety timer, plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 2.1kw and performance flow rate of 135cfm (3.82m3/min) and to be of size 270x264x143mm deep It shall have a noise level below 72.5 dBA at 1.5m. It shall be as Medclinic or approved equivalent.	0	No.		
	Urinals bowls				
I	Ceramic urinal bowl complete with 40mm heavy duty plastic bottle trap and 40mm diameter chrome plated outlet with grating firmly fixed on the wall with chrome plated screws. The fittings shall be as Twyfords or equal and approved.	0	No		
J	**Undersink water heater** 10Litres undersink water heater as hetrae sadia streamline or equivalent	0	No		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Urinal Bowl Divisions				
A	Ceramic urinal bowl divisions separating the above-described urinal bowls fixed firmly on the wall. The fittings shall be as Twyfords or equal and approved.	0	No		
	Urinal Bowl Flush Valves				
B	25mm 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 Khenger or equal and approved.	0	No		
	Kitchen Sink (SBSD)				
C	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, chrome plated bottle trap with 75mm deep seal and chain waste fitting.	0	No		
	Robe Hook				
D	Robe hook in Satin Aluminium to be mounted by concealed screws to wall wedges. To be as **Twyfords Spectrum 2000** accessories or equal and approved.	1	No.		
	Cleaner Sink				
E	Heavy duty sink size 465 x 410 x 285mm deep in enamelled fireclay complete with hardwood pad on the front edge and fitted bucket stainless steel grating and 20mm chrome plated wall mounted inclined bricon tap, chrome plate chain and rubber stopper and heavy gauge 40mmn chrome plated bottle trap, stainless steel legs and bearers and 32mm grid waste fitting. All as Twyford "cleaners sink" or approved equivalent.	0	No.		
	Chrome plated Flush valve				
F	32mm water closet low pressure flush valve for squatting water closets complete with, back entry with integral foot operated flush valve 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 Khenger or equal and approved.	0	No		
G	**Toilet paper dispensor**				
	Jumbo toilet paper dispensor as Velvex or approved equivalent anti vadal type	0	No		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Hand Spray** Chrome plated hand spray fixed next to the water closet complete with chrome plated wall bracket as Cobra or equal and approved.	1	No.		
B	**Disabled Persons Water Closet and Wash Hand Basin Facility** Wheel chair accessible W.C facility Comprising of the following: - **i)** Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow.The bowl shall be of size 375x560x420mm high.The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402 .The unit shall be complete with valveless cistern fittings including syphon, 15mm side inlet ballvalve, 20mm side overflow, plastics flushbend, inlet connector and reversible metallic chrome plated cistern lever.There shall also be a heavy duty seat(25mmhigh) and cover with chrome plated metal hinges, toilet roll holder, 610 x 610 x 6mm thick mirror and robe hook.				
	ii) Semi pedestal wall mounted W.H.B of size 600x500x545mm high with flexible connectors to waste and taps.The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 1/2" chrome plated lever action pillar tap, chrome plated waste with height adjustable trap, pedestal and wall fixing bolts.	0	Set		
	iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate plate size 230x100 mm, 4No 600mm grab rails with covered wall plates. The set shall be as Twyfords DOC.M wheelchair accessible W.C. facility or approved equivalent.				
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	INTERNAL PLUMBING **CVPC Pipes** Supply, deliver and install chlorinated polyvinyl chloride (CPVC) pipes, tubing and fittings as described and shown on the drawings. The pipes and fittings shall be produced as per SDR 11 and shall meet or exceed the requirements of ASTM D 2846, current European standards for CPVC installations and to the Engineers approval. All joints shall be assembled employing solvent cements that meet or exceed the requirements of ASTM F442 and ASTM F441 . Rates must allow for all Metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints, support raceways, supporting brackets, 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. **Pipe work-CPVC PIPES**				
A	20mm diameter pipework	10	Lm		
B	25mm diameter pipework	10	Lm		
C	32mm diameter pipework	0	Lm		
D	40mm diameter pipework	0	Lm		
E	50mm diameter pipework	0	Lm		
F	65mm diameter pipework	0	Lm		
G	75mm diameter pipework	0	Lm		
	Bends				
H	20mm diameter bend	4	No.		
I	25mm diameter bend	4	No.		
J	32mm diameter bend	0	No.		
K	40mm diameter bend	0	No.		
L	50mm diameter bend	0	No.		
M	65mm diameter bend	0	No.		
N	75mm diameter bend	0	No.		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Tees				
A	20mm equal tee	4	No.		
B	25mm equal tee	4	No.		
C	32mm equal tee	0	No.		
D	40mm equal tee	0	No.		
E	50mm equal tee	0	No.		
F	65mm equal tee	0	No.		
G	75mm equal tee	0	No.		
	Reducers				
H	25 x 20mm diameter reducer	4	No.		
I	32 x 20mm diameter reducer	4	No.		
J	32 x 25mm diameter reducer	0	No.		
K	40 x 25mm diameter reducer	0	No.		
L	40 x 32mm diameter reducer	0	No.		
M	50 x 32mm diameter reducer	0	No.		
N	50 x 40mm diameter reducer	0	No.		
O	65 x 50mm diameter reducer	0	No.		
P	65 x 40mm diameter reducer	0	No.		
Q	75 x 65mm diameter reducer	0	No.		
R	75 x 50mm diameter reducer	0	No.		
	Male/Female Adapters (Brass threaded)				
S	20mm brass threaded adapter	4	No.		
T	25mm brass threaded adapter	4	No.		
U	32mm brass threaded adapter	0	No.		
V	40mm brass threaded adapter	0	No.		
	Male/Female Bend (Brass threaded)				
W	20mm brass threaded bend	4	No.		
X	25mm brass threaded bend	4	No.		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Threaded Brass Coupling				
A	25mm threaded brass coupling	4	No.		
B	32mm threaded brass coupling	2	No.		
C	40mm threaded brass coupling	0	No.		
D	50mm threaded brass coupling	0	No.		
E	65mm threaded brass coupling	0	No.		
F	75mm threaded brass coupling	0	No.		
	Valves				
G	25mm gate valve	2	No.		
H	32mm gate valve	1	No.		
I	40mm gate valve	0	No.		
J	50mm gate valve	0	No.		
K	65mm gate valve	0	No.		
L	75mm gate valve	0	No.		
	Unions				
M	25mm diameter pipe union	6	No.		
N	32mm diameter pipe union	6	No.		
O	40mm diameter pipe union	0	No.		
P	50mm diameter pipe union	0	No.		
Q	65mm diameter pipe union	0	No.		
R	75mm diameter pipe union	0	No.		
	Flexible Tubing				
S	15mm diameter x 300mm long flexible connectors complete with integral chrome plated angle valve as Cobra or equal and approved.	2	No.		
	Pipe Sleeves				
T	100mm diameter heavy duty PVC pipe sleeves for crossing over columns and beams.	2	Lm		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	FOUL WATER INTERNAL DRAINAGE 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.				
	MuPVC and uPVC Waste and Soil pipework				
A	150mm diameter heavy gauge golden brown UPVC pipe	0	Lm		
B	100mm diameter heavy gauge grey mUPVC pipe	4	Lm		
C	50mm diameter waste pipe	4	Lm		
D	40mm diameter waste pipe	4	Lm		
E	32mm diameter waste pipe	8	Lm		
	Bends				
F	100mm diameter long radius bend	2	No.		
G	100mm diameter short radius bend	2	No.		
H	100mm diameter bend with access	2	No.		
I	100mm diameter sweep bend	2	No.		
J	50mm diameter sweep bend	4	No.		
K	40mm diameter sweep bend	2	No.		
L	32mm diameter sweep bend	4	No.		
	Tees				
M	100mm diameter sweep tee	1	No.		
N	50mm diameter sweep tee	2	No.		
O	40mm diameter sweep tee	2	No.		
P	32mm diameter sweep tee	2	No.		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Access Caps				
A	100mm diameter access cap	2	No.		
B	50mm diameter access cap	2	No.		
C	40mm diameter access cap	2	No.		
D	32mm diameter access cap	2	No.		
	Boss Connectors				
E	100 x 50mm diameter boss connector	2	No.		
F	100 x 40mm diameter boss connector	2	No.		
	Single Branches				
G	100mm diameter single branch	2	No.		
	Double Branches				
H	100mm diameter double branch	1	No.		
	WC Connectors				
I	100mm diameter WC connector	1	No.		
	Traps				
J	100 x 50mm diameter floor trap and grating	1	No.		
K	Allow for a standard 300 x 300 x 450mm masonry gully trap complete with concrete cover.	0	No.		
	Weathering Slates and Vent Cowls				
L	100mm diameter weathering slate and apron.	0	No.		
M	100mm diameter vent cowl	0	No.		
	Supporting Brackets				
N	Allow for suitable supporting steel brackets for anchoring and supporting drainage pipes bends on the lower floor. To be painted to match the walling colour.	2	No.		
	Testing and Commissioning				
O	Allow for testing and commissioning of the plumbing and drainage installations to the satisfaction of the Engineer.	1	Item		
	Total Carried Forward to Collection Page for Cinema Hall and Offices				

COLLECTION PAGE FOR CINEMA HALL AND OFFICES

Item	Description	Amount (Kshs)
1	Total Carried Forward from Page G-7 …….	
2	Total Carried Forward from Page G-8 …….	
3	Total Carried Forward from Page G-9 …….	
4	Total Carried Forward from Page G-10 …….	
5	Total Carried Forward from Page G-11 …….	
6	Total Carried Forward from Page G-12 …….	
7	Total Carried Forward from Page G-13 …….	
8	Total Carried Forward from Page G-14 …….	
9	Total Carried Forward from Page G-15 …….	
	Total for Cinema Hall and Offices Carried Forward to Summary Page	

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	AIRCONDITINING INSTALLATIONS				
	SPLIT AIR CONDITIONING SYSTEM				
	1. ROOMS WITH 7,1 KW KW HEAT GAIN				
A	The indoor unit shall be high wall type air-cooling unit of capacity 7.1KW (24,000 Btu/hr). The air conditioning unit shall be supplied complete with room thermometer, room thermostat controls and remote control device. It shall charge with R410A refrigerant or any other non-ozone depleting refrigerant. The unit shall be such that if the power supply goes off, it will start automatically after power is restored with three-minute delay.	1	No.		
	Outdoor				
B	The outdoor unit shall have matching capacity with the indoor unit and with inverter control for control of compressor speed. The unit shall be "Daikin" Model or equal and approved	1	No.		
	Refrigeration Pipework				
C	Refrigeration liquid line pipework including 25mm Amaflex insulation.	24	LM		
D	Refrigeration gas line pipework including 25mm Amaflex insulation.	24	LM		
	Refrigerant				
E	Allow R32 refrigerant for charging air conditioning system.	1	Item		
	Drain				
F	25mm PVC condensate drainage pipework, class D, including bends, clips, joints and tees in the running lengths of the pipe.	15	LM		
	Surge Protector				
G	Power surge protector as Solatek to suite or equal and approved.	1	No.		
	Electrical Works				
H	Allow for associated electrical works from the local isolator provided by others within one meter to the air conditioning units and wiring from indoor unit to outdoor unit.	1	Item		
	MOUNTING BRACKET				
I	Mounting bracket for the outdoor unit complete with a cage and provided with purpose-made protective steel iron angle frame and all other anchoring accessories including rawl bolts and anti-vibration rubber mountings to engineer's approval	1	No.		
	Trunking				
J	75x50mm approved PVC trunking for concealing the refrigerant pipework.	24	LM		
	Testing and commisioning				
K	Allow for testing and commissioning of the Split Unit	1	Item		
	Sub-Total for One Unit				
	Total Carried Forward to Collection Page				

SUMMARY PAGE

Item	Description	Amount (Kshs)
1	Preliminaries Carried Forward from Collection Page	
2	Total for Office Block Carried Forward from Collection Page ……	
3	Total for Air conditioning of Cinema Office	
4	Contingency sum	**50,000.00**
Total Amount for Sanitary Fittings, Plumbing and Drainage Installations Carried to Main Summary Page.		

Amount in words…….....
……...……...……..
Tenderer's Name and Stamp……...
Address ……...……...…..……
Period To Execute The Works ……..……...……..
Tenderer's V.A.T No ….……...…….
Tenderer's P.I.N No ….……...……. …….

Telephone No. ……..……..……

Mobile No. ……...…… …….

Tenderer's Signature …… Date……...……

Witness Signature ……..... Date……

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 authorized 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

ITEM	DESCRIPTION	UNIT	RATE (Kshs)
1.	50mm CPVC pipe	**LM**	
2.	40mm CPVC pipe	**LM**	
3.	32mm CPVC pipe	**LM**	
4.	25mm –ditto	**LM**	

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

TECHNICAL SCHEDULE

1. The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders, especially where the tenderer intends to supply or has based his tender sum on equipment which differs in manufacture, type or performance from the specifications indicated by the Project Manager/Engineer.
2. This schedule shall form part of the technical evaluation criterion, and tenderers are therefore advised to complete the schedule as they shall be considered non responsive.

NB. The tenderer must complete in full the technical schedule. Apart from the information required in the technical schedule, the tenderer **MUST SUBMIT LEGIBLE** comprehensive manufacturer's technical brochures and performance details for all items listed in this schedule and **CLEARLY HIGHLIGHT THE SPECIFIC REQUIRED ITEM ONLY.**

S/NO	DESCRIPTION	MANUFACTURER	COUNTRY OF ORIGIN	REMARKS (Catalogue No. etc.)
A	CPCV Pipe Work			
B	Split Ac Unit (24000 BTU/HR)			
C	Hand Drier			
D	Gate Valves			
E	Water Closet			
.				

Catalogue must be attached for all the items in the schedule of material above

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	PRIME COST AND PROVISIONAL SUMS				
	PRIME COST SUMS				
1	Allow a Provisional Sum of Kenya Shillings Two Million (Kshs.2,000,000.00) only for Contingency		**SUM**		**2,000,000.00**
	TOTAL FOR PROVISIONAL SUMS				

ITEM	DESCRIPTION	TENDERER'S AMOUNT	OFFICIAL USE ONLYOFF
	GRAND SUMMARY		
1	Preliminaries from page PP/10		
2	General Preliminaries from page GP/11		
3	Auditorium Dais from page ARW-S/7		
4	Electrical Installation Works from page F/11		
5	Mechanical Installation Works from page F/18		
6	Provisional Sums from page PS/1		
	TOTAL CARRIED TO FORM OF TENDER		

Amount of tender in words: Kenya Shillings.....

.....

Tenderer's Signature and Stamp.....

Address.....

Date .....

Witness: Name and signature.....

Address.....

.....

.....

Date.....