

ANNEX 1

ITEM	SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR POWER SYSTEM AT KENYA SCHOOL OF REVENUE ADMINISTRATION – MOMBASA CAMPUS
A.	<u>PRICING ITEMS OF PRELIMINARIES</u>
	Prices SHALL BE INSERTED against items of “preliminaries” in the tenderer’s priced Bills of Quantities. The contractor is advised to read and understand all preliminary items.
B.	<u>SCOPE OF CONTRACT</u>
	The works to be carried out comprises of installation of Solar Power at Kenya School of Revenue
C.	<u>DESCRIPTION OF THE WORKS</u>
	The works consists of installation of Solar Power at Kenya School of Revenue Administration - Mombasa Campus
D.	<u>MEASUREMENTS</u>
	In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT MANAGER in accordance with the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with the said Conditions.
E.	<u>LOCATION OF SITE</u>
	The sites of the proposed works is Located in Kenya School of Revenue Administration, Mombasa. The Contractor is advised to visit the site, to familiarize with, the nature and position of the site. No claims arising from the Contractor’s failure to do so will be entertained.
F.	<u>SIGNING OF THE TENDER DOCUMENTS</u>
	The bidder shall append his / her signature and / or company ‘s rubberstamp on each and every page of tender document.

ITEM	DESCRIPTION
A.	<p><u>URGENCY OF THE WORKS</u></p> <p>The Contractor is notified that these “ works are urgent” and should be completed within contractual period</p> <p>The Contractor shall allow in his rates for any costs he/ she deems that he/she may incur by having to complete these works within the stipulated contract period.</p> <p><u>PAYMENT FOR MATERIALS ON SITE</u></p> <p>The materials on site shall be deemed to belong to the employer when paid for and after assessment by the Project Manager to ensure the materials meet the specifications</p> <p><u>EXISTING SERVICES</u></p> <p>Prior to the commencement of any work, the Contractor is to ascertain from the relevant personnel the exact position and level of all existing services in the area and he/she shall make whatever provisions may be required for the support, maintenance and protection of such services.</p> <p><u>PARTICULAR PRELIMINARIES</u></p> <p><u>EMPLOYER</u></p> <p>The Employer is the Kenya School of Revenue Administration</p> <p>The term "Employer" and " Kenya School of Revenue Administration" wherever used in the contract document shall be synonymous.</p> <p><u>PROJECT MANAGER</u></p> <p>The term "PM" wherever used in these Bills of Quantities shall be deemed to imply the project Manager as defined in Condition 1 of the Conditions of Contract or such person or persons as may be duly authorised to represent him on behalf of the Government .</p>

	BILL NO. 1 Preliminaries	
ITEM	DESCRIPTION	AMOUNT
A.	<u>INSURANCE</u> The Contractor shall insure as required in Conditions under Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the Employer either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing. Insurance shall include insuring employees and works	
B	<u>DRAWINGS</u> Allow for 3No. Sets working drawings for approval Allow for 3No. Sets of printed A3 as-built drawings and soft copy in CD Rom and Flashdisk	
	Sub-total carried to collection pg	

BILL NO. 3 SOLAR INSTALLATION (SOLAR (PV))				
DESCRIPTION		QTY	COST	TOTAL PRICE KSh
Supply, install, test commission the following in accordance to IEC, BS and KS standards. Th items should be from a reputable company and must be approved before installation. For panels and inverters outside desired brands bidders must provide sufficient technical information.				
A PV System				
i 585 Watts N-type Monocrystalline silicon cells, bifacial PV solar module with dual glass as Jinko or approved equivalent as per attached specifications	No	130		
ii Power Optimizer for capable of allowing panel level monitoring, reduction of DC voltage to safe levels in emergency situations and with Maximum Power Point Tracking feature.	No	1		
iii 1000Vdc 9strings input all weather intelligent combiner box as HISbox DC combiner box or approved equivalent	No	1		
B PV connection cables				
i 6sqmm 1500V PV cable complete with MC4 module connectors and all necessary wiring accessories for the above solar modules	Lm	1100		
ii 6sqmm earthing PV cable complete with MC4 module connectors and all necessary wiring accessories for the above solar modules	Lm	500		
iii 16sqmm 1500V PV cable complete with necessary glands and lugs from combiner box to the inverter.	Lm	134		
C Inverter				
i 100kw grid connected inverter with max input voltage 1000v dc rated IP65 and above, mini 98% efficient capable of avoiding feeding back excess power to the grid, complete with monitoring tool and web based platform as Fronius and approved equivalent.	No	1		
ii 125A 2P DC isolator switch integrated with type II surge protection devices as ABB in an IP65 matt finish wall mounted enclosure . Toughened PVC enclosure is acceptable	No	1		
iii Ditto for shuntable 200A 4P 15kA mccb for AC side of the inverter	No	1		
iv IP68 emergency switch button for AC complete with 2cx2.5 pvc/pvc cable to be connected to the mccb above	No	1		
D AC Cables and Management				
i 4C x 35mm sq PVC/XLPE/SWA copper cable ss EA complete with glands and shrouds from the inverter to switch board	Lm	50		
ii 200mmx50mm galvanised steel perforated cable tray complete with tees, crossovers, bends end caps, mounting brackets.	Lm	150		
E Earthing				
i Soil resistivity test with a range	Item	1		

ii	DC earth installation comprising of 16 sqmm sc Copper earthing cable from roof copper cable from the roof to copper earth electrode of 1500mm long x15mm diameter together with a Earth mat and earthing compound enclosed by a clearly labelled concrete manhole of size 300mmx 300mmx 70mm and removable cover.	Item	1		
	F Solar Structure				
iii	Supply and install on roof aluminum solar support structure overall dimensions 8x2.4m fabricated from 40x60x2 mm angle line trusses spaced at 2.4m spacings, and 2 no. 27x42x1.7mm 0.7kg/m aluminum frame rail as 229-0101 Hydro Aluminum Ltd catalogue or other approved equivalent spanning across the trusses, complete with brackets to hold in place the solar panels. All members to be powder coated.	No	2		
iv	The contractor shall Fabricate and Install galvanized steel ladder overall size 400mm wide by 5m high to the top of the roof comprising of: 2No. 50 x 10mm thick flat bars, 20x20x3mm square hollow sections welded at 300mm centers commencing at 300mm from the finish ground level all through to the top: lockable 750mm diameter protective back rail fixed from 1800mm above the ground level at 1000mm centers comprising of 50x5mm flat bars, 3No. 50x5mm vertical supports: The whole system fixed to concrete beams: Prepare and apply aluminum paint to steel surfaces	Lot	1		
v	Aluminum open-mesh roof walk path of 800mm width and raised to 50mm minimum height complete with mounting brackets, bolts, lifeline and all other anchorage items	Lm	90		
	G Monitoring System				
i	Allow for a suitable server based monitoring system for the on Grid solar PV system complete cisco switch router and to be connected to kra server. This should include associated softwares for monitoring tool for PV system performance. The system should be able to generate reports and send alert messages via sms or email.	Item	1		
	H Energy meter				
i	Dual tariff export/import power meter for measuring solar consumption	No	1		
ii	2.5mmx 4C communication cable from the optimizer to the inverter and to the LV boards for aiding power synchronization between grid and solars	Lot	1		
iii	CAT6A UTP cable as SIEMON Z-Max complete with RJ45 Connectors	Lm	20		
iv	43" monitoring screen as LG nanocell smart tv complete with mounting brackets to be installed in Mombasa and Nairobi	No	2		
v	Electrical materials and accessories needed to complete installation works (cable ties, mounting bolts, nuts and other necessary cables and materials, signages and labelling, etc)	Lot	1		
	I Cleaning Hose reel				
i	Water point done in 60m long horse reel with lockable clamp and nozzle	Item	1		

K	Lighting Protection System				
	i Copper type Earth electrode complete with test clamps.	No.	1		
	ii 25 x 3mm lightning protection copper tape complete with all accessories	Lm	40		
	iii 1.5 M Copper Rod Air termination spikes complete with base and clamp.	No.	1		
	iv Supply and install 350mm x 350mm earth pit complete with clearly marked cover, the earth mass to be well treated to Engineers approval and filled with red soil.	No	1		
	vi Allow a sum for bonding all roof metal works and water tanks.	Sum	1		
	SUB TOTAL				

BILL NO. 4: CCTV					
Item	Description	Qty	Unit	Rate (Kshs)	Amount (KShs)
1	Supply, Install, Program, Test and Commission the following :- IP-CCTV SURVEILLANCE SYSTEM CAMERAS				
1.1	6Megapixels Outdoor Network Bullet Camera with 2.8-12mm Lens as per specifications attached	2	No.		
1.2	6Megapixel resolution Weatherproof Network IR OUTDOOR BULLET built-in IR LEDs Camera; as specified in the technical specifications.	2	No.		
1.4	8MP Varifocal Dome Network Camera POE built-in, True Day/Night as per specifications attached	4	No.		
1.4	6mp Network Fisheye Camera with H265/264 video compression as per attached specification	1	No.		
1.5	Digital universal key board complete with PTZ Control Joystick (3-axis twist zoom) and LCD screen	1	No.		
1.6	42" LED Monitor, 1,920 x 1,080 resolution 600TV lines, Response Time 8ms (G to G), Panel Life 50,000hours, Contrast Ratio 5,000 : 1, HDMI, DVI, VGA, and component (CVBS common) video output, Ethernet / RS- 232C remote control, Built-in speaker. (C/w wall mount bracket); 3year warranty.	1	No.		
2	ACTIVE COMPONENTS				
2.1	D Link DGS-1210-52MP – 48-Port Gigabit Smart Managed PoE Switch with 4 Gigabit RJ45/SFP COMBO ports, 370W PoE Budget as per attached specifications	1	No.		

	Total Surveillance				
	Network Backbone				
Item	Description	Qty	Unit	Rate (Kshs)	Amount (KShs)
3	CABLING, BACKBONE CABLING AND GENERAL REQUIREMENTS				
3.1	Multi Mode Fiber Optic 8 Core Cable (Armoured)	40	Lm.		
3.2	SFP Fiber Optic Cable Connector/Transceiver as CISCO or approved equivalent.	3	No.		
3.3	LC-SC fiber Patch Cord.	3	No.		
3.4	Fiber Optic Cable Connectors	3	No.		
4	CABINETS				
4.1	22U Floor mounted equipment and server cabinet with lockable door, low noise (low Db) fans and power outlet sockets (Additional 6-Way power extension cable, surge protected within the cabinet).	1	No.		
4.3	12 Port UTP Patch Panel as Siemon or its equal and approved equivalent C/W all the necessary accessories as per attached specifications	1	No.		
4.4	240V, 50Hz, 3KVA, 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.		
4.5	8TB Surveillance SATA HDD Suitable for NVR above(Connect to KRA 0 server)	0	No.		Nil
4.6	64CH Network Video Recorder (NVR); as specified in the technical specifications.	1	No.		

4.7	Grounding and bounding kit complete with 50mm diameter copper bounding bar and 6mm thick green and yellow wire complete with cable lugs and any other necessary accessories. The Earthing of the system is to be to the approval of the Electrical Engineer.	1	Lot		0
	Total Network backbone				-

Power and Cabling					
Item	Description	Qty	Unit	Rate (Kshs)	Amount (KShs)
4.8	3cx2.5mm ² pvc/pvc cable for UPS	20	Lm		
4.8	Raw power socket outlet power points comprising wiring in 3 x 2.5 mm ² PVC/SC CU cables drawn in 25mmØ concealed HG PVC conduits/trunking including all conduit accessories but excluding plates:-	2	No		
	a) 13A, moulded ivory white twin switched socket outlet plates as Crabtree or approved equivalent as follows:	2	No.		
5	CABLING				
5.01	Cat 6A UTP 4 Pair cable as Siemon or its equal and approved equivalent.	1500	Lm.		
5.02	1M, Cat 6A, UTP factory terminated Patch Cords as Siemon or its equal and approved equivalent.	1	Lot		
5.03	Cat 6A, UTP Cable Manager (Organizer) as Siemon or its equal and approved equivalent C/W all the necessary accessories.	1	No.		

5.04	Supply and install factory manufactured corner rectangular trunking of dimensions 50x25mm one compartment along all walls. Trunking to be powder coated and white in colour (Colour as shall be approved by the PM)-Provisional	70	Lm.		
5.06	32mm Flexible Conduits in metres	50	Lm.		
5.07	25mm Flexible Conduits in metres	300	Lm.		
5.08	Cable Ties.	1	Item		
5.09	CCTV outlet point done in 25mm diameter HG PVC conduits concealed in building fabric/trunking complete with all necessary accessories	20	Item		
Total power and Cable					

	Summary				
	Surveillance				
	Network Backbone				
	Power and Cabling				
	Sub-total carried to collection pg				

Item	Description	Amount (KShs)
	<p>Bill no 1: Cotract preliminaries and Insurance</p> <p>Bill no. 2: Solar installations</p> <p>Bill no. 3: Surveillance installations</p> <p>Allow for associated civils works: Drilling, hacking of the walls and making good disturbed areas</p> <p>Allow for testing and commissioning in accordance with the contract and Engineers satisfaction</p> <p>Labelling: Allow for labelling all telecommunication cables, active devices and telecommunicatio points and all necessary documentation</p> <p>Total</p> <p>5% Contingency</p> <p>Total + Contingency</p> <p>16% VAT</p>	
	Total Amount in the BoQ	