

SCHEDULE NO. 4
INSTALLATION AND OTHER SERVICES
FOR KABARNET SUBSTATION

Note: All of the blank cells shall be filled with quoted price or "included". Any other alternation interpreted as "included". It means that relevant price has been included in other items.

1	2	3	4	5	6	7	8	9	10
Item No	Description	Unit	Estimated Quantity	Foreign Currency (FC1) = USD Foreign Currency (FC2) = EURO Local Currency (KSh) = KENYAN SHILLINGS			Total Price		
				Installation and other Services			Installation and other Services		
				Unit Price			(Quantity x Unit Price)		
				FC1	FC2	KSh	FC1	FC2	KSh
1	132kV PRIMARY PLANT								
1.1	132kV Circuit Breaker (3 phase) 1600A, 31.5kA- Single pole	No.	2						
1.2	132kV Circuit Breaker (3 phase) 1600A, 31.5kA	No.	1						
1.3	132kV Circuit Breaker (3 phase) 2000A, 31.5kA	No.	1						
1.4	Motorized disconnector (3-phase) 132kV, 1600A, 31.5kA, without earthing switch with earth mat	No.	3						
1.5	Motorized disconnector (3-phase) 132kV, 2000A, 31.5kA, without earthing switch with earth mat	No.	2						
1.6	Motorized disconnector (3-phase) 132kV, 1600A, 31.5kA, with one (1) earthing switch, and earth mat	No.	7						
1.7	Motorized disconnector (3-phase) 132kV, 1600A, 31.5kA, with two (2) earthing switches, and earth mat	No.	1						
1.8	Motorized earthing switch (3-phase) with earth mat	No.	2						
1.9	Surge arrester 132kV (1-phase) including surge counter and earth leakage meter	Lot	9						
1.10	Post Insulator	Lot	1						
1.11	Insulator string (suspension and strain types with hardware fitting)	No.	1						
1.12	132 kV Post type current transformer, for protection and metering, six cores (1-phase)	No.	12						
1.13	132 kV Post type current transformer, for protection and metering, five cores (1-phase)	No.	3						
1.14	132 kV Post type current transformer, for protection and measuring, three cores (1-phase)	No.	3						
1.15	132 kV Post type current transformer, for protection, two cores (1-phase)	No.	3						
1.16	132 kV Capacitive voltage transformer protection and metering three cores (1-phase)	No.	6						

1.17	132 kV Capacitive voltage transformer protection and measuring two cores (1-phase)	Lot	3						
1.18	Conductor - Tubular	Lot	1						
1.19	Conductor - Stranded	Lot	1						
1.2	Connectors and clamps for tubular conductors (together with stainless steel nuts, bolts, bimetal)	Lot	1						
1.21	Connectors and clamps for stranded conductors (together with stainless steel nuts, bolts, bimetal)	Lot	1						
1.22	Busbars modification from single bus to double buses configuration with all required connections, demolition, modification, relocation and replacement works for the existing area	Lot	1						
1.23	Replacement of CT of existing 132kV bays (one line and one transformer feeder) to comply with the busbar protection according to the SLD drawings	Lot	1						
1.24	Demolition, Relocation and Re-installation of the complete equipment (Circuit Breaker, Disconnectors, current transformers, voltage transformers, Surge arrestors, conductors and accessories,...etc), support structures, gantry, etc of the existing 132kV Lessos OHL bay including the supply of necessary additional power supply cables, control cables, earthing conductors, fiber optic cables,...etc to cover the extended distance and other accessories to make the system functional	Lot	1						
1.25	All required modification, replacement, relocation, disassembling and transportation works to change the busbar configuraion and to make the system complete and functional implementation of earth mat for existing DS(E)/ES	Lot	1						
1.23	TOTAL PRICE ITEM 1								

2	33kV PRIMARY PLANT								
2.1	Circuit breaker (3-phase)	No.	4						
2.2	Motorized disconnecter (3-phase), without integral motorised earth switch, with earth mat	No.	5						
2.3	Motorized disconnecter (3-phase), complete with one integral motorised earth switch, and earth mat	No.	3						
2.4	Surge arrester (1-phase) including surge counter and earth leakage meter	No.	9						
2.5	Post insulator	Lot	1						
2.6	Insulator string (suspension and strain types with hardware fitting)	Lot	1						
2.7	Post type current transformer protection and metering four cores (1-phase)	No.	12						
2.8	Post type current transformer, for protection, three cores (1-phase)	No.	3						
2.9	Voltage transforme protection and metering two cores (1-phase)	No.	12						
2.1	40.5kV, 0.5A 1phase cut off fuse	No.	3						
2.11	Conductor - Tubular	Lot	1						
2.12	Conductor - Stranded	Lot	1						
2.13	Connectors and clamps for tubular conductors (together with stainless steel nuts, bolts, bimetal)	Lot	1						
2.14	Connectors and clamps for stranded conductors (together with stainless steel nuts, bolts, bimetal)	Lot	1						
2.15	One circuit of 33kV for interconnection between 132kV switchgear (TR-2) and 33kV Switchyard Transformer feeder including requirement	Lot	1						
2.16	All required modification, replacement, relocation, disassembling and transportation works to make the system complete and functional	Lot	1						
2.18	TOTAL PRICE ITEM 2								
3	POWER TRANSFORMER (P.TR.)								
3.1	Power transformer three phase units HV132/LV33kV, 18-23MVA including HV/LV/Neutral Bushing CT's, OLTC, RTCC, Control Cabinet and all accessories as required acc. to Tech. Spec. and TDS	No.	1						
3.2	50 kg wheeled Dry-Powder Fire extinguisher for Auxiliary transformer	No.	1						
3.3	TOTAL PRICE ITEM 3								
4	AUXILIARY TRANSFORMER								
4.1	Auxiliary transformer three phase units HV33/LV0.415kV, 250KVA,including all accessories as required	No.	2						
4.2	40.5kV, 5A 1-phase cut off fuse	No.	3						

4.3	All required modification, replacement, relocation, disassembling and transportation works related to replacement of existing auxiliary transformer and hand over to KETRACO at designated Employer's warehouse.	Lot	1						
4.3	TOTAL PRICE ITEM 4								
5	132kV PROTECTION SYSTEMS								
5.1	132kV OHL Protection System including:								
5.1.1	Main 1 21L Protection(with all required functions as per PSLD)	No.	2						
5.1.2	Main 2 87L Protection(with all required functions as per PSLD)	No.	2						
5.1.3	Auto-Reclose Protection Relay(with all required functions and Voltage Selection Logic as per PSLD)	No.	2						
5.1.4	All other relays or functions such as over voltage; under voltage; trip relay; trip/circuit supervision; pole discordance; synchro check; fuse failure; close relay; lockout relay; short zone, end zone; circuit breaker failure, cubicles, test blocks and test plugs, aux. relays, timers, terminals, Labels, etc. as needed to complete the full protection scheme.	Lot	1						
5.1.5	Panels including all accessories, e.g. trip circuit supervision, trip relays, test terminal blocks, wiring etc. to make the system complete	No.	4						
5.2	Transformer 132kV Side Protection System including:								
5.2.1	Main 87T+87NT Protection(with all required functions as per PSLD)	No.	1						
5.2.2	Backup 50/51, 50N/51N Protection(with all required functions as per PSLD)	No.	1						
5.2.3	All other relays or functions such as over voltage; under voltage; trip relay; trip/circuit supervision; pole discordance; synchro check; fuse failure; close relay; lockout relay; short zone, end zone; circuit breaker failure, cubicles, test blocks and test plugs, aux. relays, timers, terminals, Labels, etc. as needed to complete the full protection scheme.	Lot	1						
5.2.4	Panels including all accessories, e.g. trip circuit supervision, trip relays, test terminal blocks, wiring etc. to make the system complete	No.	1						
5.3	Completion and Modification of 132kV Low Impedance Type Busbar Protection System								
5.3.1	132kV Low Impedance type Busbar Protection Relay with Check zone ACC. To PSLD drawing and considering future extention	No.	2						
5.3.2	Panels including all accessories, e.g. trip circuit supervision, trip relays, aux relays, test and terminal blocks, timers, wiring etc. to make the system complete	No.	2						
5.3.3	Decommission existing busbar panels and associated accessories and hand over to Employer at a designated location in Kenya	Lot	1						
5.3.4	Low impedance busbar protection system including panels, relays, auxiliary relays, and all accessories for double bus scheme extension/modification scope with compete retesting, recommissioning and all other modifications	lot	1						
5.4	132kV Coupler Protection System including:								
5.4.1	Over Current 50/51, 50N/51N (with all required functions as per PSLD)	No.	1						

5.4.2	Bay Control Unit integrated with synchro-check function (with all required functions as per PSLD)	No.	1						
5.4.2	All other relays or functions such as over voltage; under voltage; trip relay; trip/circuit supervision; pole discordance; synchro check; fuse failure; close relay; lockout relay; short zone, end zone; circuit breaker failure, cubicles, test blocks and test plugs, aux. relays, timers, terminals, Labels, etc. as needed to complete the full protection scheme.	Lot	1						
5.4.3	Panels including all accessories, e.g. trip circuit supervision, trip relays, test terminal blocks, wiring etc. to make the system complete	No.	1						
5.5	Miscellaneous modification works as necessary to make a complete functional 132kV protection system	Lot	1						
5.6	TOTAL PRICE ITEM 5								
6	33KV PROTECTION SYSTEMS								
6.1	Transformer 33kV Side Protection System including:								
6.1.1	50/51, 50N/51N Protection(with all required functions as per PSLD)	No.	1						
6.1.2	Earth Fault 50N/51N (SBEF) Protection (with all required functions as per PSLD)	Lot	1						
6.1.3	All other relays or functions such as over voltage; under voltage; trip relay; trip/circuit supervision; pole discordance; synchro check; fuse failure; close relay; lockout relay; short zone, end zone; circuit breaker failure, cubicles, test blocks and test plugs, aux. relays, timers, terminals, Labels, etc. as needed to complete the full protection scheme.	No.	1						
6.1.4	Panels including all accessories, e.g. trip circuit supervision, trip relays, test terminal blocks, wiring etc. to make the system complete	No.	1						
6.2	Power Transformer Automatic Voltage Regulation System including:								
6.2.1	Automatic Voltage Regulator Relay (AVR)	No.	1						
6.2.2	Panels with all accessories and auxiliaries, lighting, heating, socket, push buttons, wiring, terminals, test facilities, discrepancy and all other switches, labels, unit measurement indicating lamps, position indicators, alarm annunciators, temperature indicators, test block/plug, Labels, etc. and with the following equipment.	No.	1						
6.3	33kV Coupler Protection System Including:								
6.3.1	Overcurrent 50/51 And Earth Fault 50N/51N Protection(with all required functions as per PSLD)	No.	1						
6.3.2	Bay Control Unit integrated with synchro-check function (with all required functions as per PSLD)	No.	1						
6.3.2	All other relays or functions such as over voltage; under voltage; trip relay; trip/circuit supervision; pole discordance; synchro check; fuse failure; close relay; lockout relay; short zone, end zone; circuit breaker failure, cubicles, test blocks and test plugs, aux. relays, timers, terminals, Labels, etc. as needed to complete the full protection scheme.	Lot	1						
6.3.3	Panels including all accessories, e.g. trip circuit supervision, trip relays, test terminal blocks, wiring etc. to make the system complete	No.	1						
6.4	Completion and Modification 33kV Low Impedance Type Busbar Protection System								
6.4.1	33kV Low Impedance type Busbar Protection Relay ACC. To PSLD drawing and considering future extension	No.	2						

6.4.2	Panels including all accessories, e.g. trip circuit supervision, trip relays, aux relays, test and terminal blocks, timers, wiring etc. to make the system complete	No.	2						
6.4.3	Decommission existing busbar panels and associated accessories and hand over to Employer at a designated location in Kenya								
6.5	33kV Feeder Protection System Including:								
6.5.1	Main 1 21L Protection(with all required functions as per PSLD)	No.	2						
6.5.2	Bay control and protection unit with intergrated auto-reclose function(with all required functions as per PSLD)	No.	2						
6.5.3	All other relays or functions such as lockout; circuit breaker failure, cubicles, test blocks/plugs, aux. relays, timers, terminals, Labels, etc. as needed to complete the protection.	No.	2						
6.5.4	Panels including all accessories, e.g. trip circuit supervision, trip relays, test terminal blocks, wiring etc. to make the system complete	No.	2						
6.6	Miscellaneous modification works as necessary to make a complete functional 33kV protection system	Lot	1						
6.6	TOTAL PRICE ITEM 6								
7	132/33kV SUBSTATION CONTROL SYSTEM								
7.1	Substation automation system including:	Lot	1						
7.2	All software and license, Modifications in HMI	Lot	1						
7.3	Bay Control and Protection Units (BCU/BCPU)(with all required functions as per PSLD)	No.	3						
7.4	Bay Control Panels	No.	3						
7.5	Auxiliary and Common Services Bay Control Unit	Lot	1						
7.6	Auxiliary and Common Services Panel including all accessories	Lot	1						
7.7	Bay level LAN (Switches, Star-Coupler, Fibre Optic Cables etc.)	Lot	1						
7.8	Completion of Human Machine Interface Systems and Computers	No.	2						
7.9	TOTAL PRICE ITEM 7								
8	CONTROL AND PROTECTION SYSTEM IN EXISTING REMOTE SUBSTATIONS								
8.1	Equipment for Modification works at Remote SS (Already considered at Rumuruti)	Lot	0						
	TOTAL PRICE ITEM 8								
9	TELECOMMUNICATION & NCC/RCC/NSCC								
9.1	Required equipment for modification works at existing Kabarnet 132/33kV substation Telecommunication and Teleprotection Signalling System	Lot							
9.1.1	Required equipment for modification works at existing Telecommunication SDH System in 132/33kV Substation	Lot	1						
9.1.2	Required equipment for modification works at existing Teleprotection Signalling Equipment Interface Board for Distance & Differential protection relay in 132/33kV Substation	Lot	1						
9.2	New Firewall system with all necessary Licenses	Lot	1						
9.3	Modification works at existing IP Phone including all necessary Licenses, Network switches and any other facilities for communication with NCC,RCC and NSCC	Lot	1						
9.4	Required equipment for incorporating new and modified substation equipment into the SCADA/EMS System at the NCC/RCC/NSCC	Lot	1						
9.5	Required equipment for modifications to NCC/RCC/NSCC mimic board (if any)	Lot	1						

9.6	All necessary licences, hardware, software and configuration needed for the existing network management system (NMS) to create the STM-1 link that forms part of the Optic network from Kabarnet 132/33kV Substation and other Substation to the NCC/RCC/NSCC	Lot	1						
9.7	Required equipment for modification works at existing PABX in Lessos RCC including all necessary Licenses, Network switches and any other facilities for communication with NCC,RCC and NSCC	Lot	1						
9.8	Required equipment and accessories for interconnection between the OPGW and fibre optic cable in communication room	Lot	1						
9.8.1	Optical Distribution panel for Main Communication room	Lot	1						
9.8.2	Optical Distribution Unit (OCDF) 48 cores fiber for Main Communication room	Lot	1						
9.8.3	Digital Distribution Unit (ODF) for 48 cores fiber	Lot	1						
9.8.4	Tail Optical Fiber	Lot	1						
9.8.5	48 cores Optical Cable	Lot	1						
9.8.6	2M Coaxial Cable	Lot	1						
9.8.7	PVC Pipe suitable for the distance between entry gantry and communication room	Lot	1						
9.8.8	Optical Cable plane	Lot	1						
9.8.9	Steel Tube from junction box to entry of cable channel	Lot	1						
9.8.10	OPGW Splice Closures joint box with all accessories	Lot	1						
9.11	TOTAL PRICE ITEM 9								
10	LV CABLES AND ACCESSORIES								
10.1	Auxiliary power and control cabling including single and three phase power cables, control cables required for control; protection; metering and alarms, CTs and CVTs cable circuits, DC supply cables.	Lot	1						
10.2	Substation internal fibre optic cabling, coaxial cables.	Lot	1						
10.3	Cabling installation including, cable trays, ladders, supports & fixing calmps, accessories, glands, lugs, terminals, rails, labels, cable shoes, fire proof sealing of ducts/conduits/openings etc.	Lot	1						
10.4	TOTAL PRICE ITEM 10								
11	EARTHING & LIGHTNING PROTECTION								
11.1	Earthing system (including main earth grid, earth mat, rizer, bonding, connector, clamp, fitting, earth rod and well, inspection earth pits etc. as required)	Lot	1						
11.2	Lightning protection system (including shield wire, air termination rod, down conductor, equipotential bonding, disconnecting link, etc. as required)	Lot	1						
11.3	Installation of earth mat for the existing DS(E) and ES	Lot	1						
11.4	TOTAL PRICE ITEM 11								
12	SUPPORT STRUCTURES								
12.1	Steel supports for 132kV equipment and accessories (including all the required hot dip galvanised steel, bolts, nuts, anchore bolts, plates and etc.)	Lot	1						
12.2	Steel supports for 33kV equipment and accessories (including all the required hot dip galvanised steel, bolts, nuts, anchore bolts, plates and etc.)	Lot	1						
12.3	Gantries and other structures within the Substation (including all the required hot dip galvanised steel, bolts, nuts, anchore bolts, plates and etc.)	Lot	1						
12.4	Structures for interconnecting 132kV and 33kV switchyards (including all the required hot dip galvanised steel, bolts, nuts, anchore bolts, plates and etc.)	Lot	1						
12.5	TOTAL PRICE ITEM 12								
13	CIVIL WORKS Note: All required material and works shall be included in the quoted price in this section.								

13.1	Site survey	Lot	1						
13.2	Site clearance like removal of shrubs, bushes, vegetation, buildings, foundations as necessary	Lot	1						
13.3	Earth works including excavation, backfilling and excavation in rock up to a depth of 2m	Lot	1						
13.4	Soil Investigation (Geotechnical and geo-electrical) (Boreholes and trial pits)	Lot	1						
13.5	Temporary works	Lot	1						
13.6	Grading and landscaping on completion	Lot	1						
13.7	Surfacing with gravel	Lot	1						
13.8	Extension and Integration of Drainage system (including: excavation, backfill, channel slopping, lean concrete, reinforcement, formwork, concrete placement, concrete curing, grating plates, filter aggregates and others)	Lot	1						
13.9	Substation land boundary chain-link fence including security for watch and ward during construction phase, as per bid drawings.	Lot	1						
13.1	Switchyard are chain-link fence as specified in part 2-A Employer's requirement	Lot	1						
13.11	Cable trenches / ducts (including: excavation, backfill, channel slopping, lean concrete, reinforcement, formwork, concrete placement, concrete curing, grating plates, Cover Slab and others)	Lot	1						
13.12	Substation road and fence Lighting System, with all related equipment including Lighting fixture and terminal boxes, Steel lighting poles with related terminals, fuses, fixtures, lamps and etc., cables and related accessories, distribution boards and etc.	Lot	1						
13.13	Foundation of 132kV equipment/support structures (including: excavation, backfill, reinforced concrete, lean concrete, formatting, grout, reinforcement, galvanized anchor bolt and others).This includes foundation of Lessos which shall be demolition and re-installed	Lot	1						
13.14	Foundation of 33kV equipment/support structures (including: excavation, backfill, reinforced concrete, lean concrete, formatting, grout, reinforcement, galvanized anchor bolt and others)	Lot	1						
13.15	Foundation of gantries and other structures within substation (including: excavation, backfill, reinforced concrete, lean concrete, formatting, grout, reinforcement, galvanized anchor bolt and others)	Lot	1						
13.16	P.TR. foundation, Plinth and oil drain pits (including: excavation, backfill, reinforced concrete, lean concrete, formatting, grout, reinforcement, metal works and fittings and others)	Set	2						
13.17	Auxiliary Transformer foundation, Plinth and oil drain pits (including: excavation, backfill, reinforced concrete, lean concrete, formatting, grout, reinforcement, metal works and fittings and others)	Set	2						
13.18	Miscellaneous foundation to complete the works (such as NER, DG, tanks, etc.)	Lot	1						

13.2	Substation internal access road to concrete standards complete with drainage facilities and culverts as necessary suitable for heavy machine's traffic, as per bid drawings (including road leveling, lean concrete, prefabricated concrete kerb, base and sub-base, width 8&6&4&3 meters width and others)	Lot	1						
13.21	Rehabilitation and spot improvement of any damaged sections of existing external access road to bituminous standard and subject to Client's approval Note: The access road length shall be included in the quoted price as required, and no surcharge is accepted.	Lot	1						
13.22	The existing retaining walls shall be extended for extension area to ensure the required stability of the equipment's foundation (including both demolition and construction works)	Lot	1						
13.23	Battery room shall include automatic full redundant double fans and ventilating louver against the fan, eyewash and wide-windows shall be avoided to prevent batteries exposure to sun shine (Modification and Blocking or removal of windows, improvement of ventilation in the existing battery room)	Lot	1						
13.24	All required demolition, modification, replacement, relocation and transportation works to make the system complete and functional (including Demolition of reinforced concrete of equipment foundation and removal of fence)	Lot	1						
13.25	Diesel generator house Civil works (including Excavation, concrete works, backfilling, and etc.) together with building services (e.g. Lighting, Small Power System, Fire Detection and hand-held fire extinguishers)	Lot	1						
13.25	TOTAL PRICE ITEMS 13								
14	AUXILIARY SUPPLY								
14.1	Completion & Modification, wiring and integration of LVAC system including AC distribution outdoor cubicles, AC Main and distribution panels in Control building, LVAC distributed panel/fuse box for oil treatment socket	Lot	1						
14.1.1	Required MCB's (the tenderer shall give a list specifying details) according to drawing and specification. All MCCB/MCB for future extension shall be considered.	Lot	1						
14.1.2	Required relays, racks, Labels, cubicles, terminals, alarm, switches, busbars and etc as needed to complete the LVAC	Lot	1						
14.2	Completion & Modification, wiring and integration of 110Vdc supply including batteries with frames and all accessories, fuse box, battery chargers with all accessories, meters, protection and auxiliary relays, contactors, MCBs, panels & distribution boards incorporating auto-changeover	Lot	1						
14.3	Completion & Modification, wiring and integration of 48Vdc supply including batteries, fuse box, battery chargers, panels & distribution boards incorporating auto-changeover, protection & auxiliary relays, contactors.	Lot	1						
14.4	Completion & Modification, wiring and integration of 415V ac Uninterruptible Power Supply including isolating by-pass transformers, inverters, static switch, manual bypass switch, panels & distribution boards	Lot	1						
14.5	TOTAL PRICE ITEM 14								
15	TARIFF METERING								
15.1	Tariff metering Syatem for 132kV OHL, complete with wiring, accessories and etc. including:								
15.1.1	Main Meter including Watthour-meter (Multi tariff), Varhour-meter (Multi tariff), with 0.2S class accuracy	No.	2						

15.1.2	Check Meter including Watthour-meter (Multi tariff), Varhour-meter (Multi tariff), with 0.2S class accuracy	No.	2						
15.2	Tariff metering Syaytem for Power Transformer, complete with wiring, accessories etc. and including:								
15.2.1	Main Meter including Watthour-meter (Multi tariff), Varhour-meter (Multi tariff), with 0.2S class accuracy	No.	1						
15.3	Tariff metering System for 33kV , complete with wiring, accessories and etc. including:								
15.3.1	Main Meter including Watthour-meter (Multi tariff), Varhour-meter (Multi tariff), with 0.2S class accuracy	No.	2						
15.4	Metering data collection and communication system, complete with fibre optic cabling, accessories, Each kind of energy meters software and communication ports. All media and accessories in order to transferring Energy meter measuring values to remote center according to both KETRACO and KPLC required specification.	Lot	1						
15.5	Metering panel with all accessories and auxiliaries, lighting, heating, socket, wiring, terminals, test facilities, and all other switches, labels, test block/plug , Labels, etc.	Lot	1						
15.6	All other related relays, racks, Voltage/Current test block, cubicles, terminals, As needed to complete the metering system.	Lot	1						
15.6	TOTAL PRICE ITEM 15								
16	MISCELLANEOUS								
16.1	Padlocks / Keys	Lot	1						
16.2	Equipment labels, safety warning plates, road signages, room name plates etc.	Lot	1						
16.3	Bay Marshalling Kiosk	Lot	1						
16.4	CCTV System, With all ralated equipment for indoor and outdoor including Cameras of required type and specifications with Poles, Recorder and storage and monitor, Switch, Cabling, Boxes, Fixings and brackets and etc.	Lot	1						
16.5	50 Mbps symmetric internet bandwidth in the control room building for scalable and future-proof connectivity to support basic IT Functions (Email, ERP access, VoIP, Patch Management) and Video Surveillance Streaming and Remote Support Capabilities . Design should allow easy upgrades of bandwidth and hardware as needs evolve.	Lot	1						
16.6	Any other item not included above but required to complete the project successfully. (Tenderer shall specify and include breakdown of price in his proposal)	Lot	1						
16.6	TOTAL PRICE ITEM 16								
17	Mobilization, Site Transport, Site Office and Permanent Living Provision as per Employer's Requirements, Clause 27 and 28 of Part 2-A of Employer's Requirements	months	24						
17.1	Vehicles as per part 2-A, Clause 28								
17.1.2	Operation, maintenance, regular upkeep of the vehicles including spares, consumables and services of driver/mechanic experienced in desert driving, insurance etc. for the entire duration of the contract as per part 2-A, Clause 28	months	36						
17.2	Temporary Works, Site Office, Site Storage and Living Accomodation as per Clause 27 and 29 of Part 2-A								
17.2.1	Mobilization including all required equipment, machineries, devices, tools and facilities as specified in Clause 2.6 of section III of Part1 and Clause27 and 28 of Part 2-A	Lot	1						

17.2.2	Site Office fully equipped/furnished as specified in the Employer's Requirements and with fully furnished kitchenettes, Storage Facilities as per Clause 27 of Part 2-A	months	24						
17.2.3	Site power supply from local power network, etc.	Lot	1						
17.2.4	Site temporary fencing with barbed wire	Lot	1						
17.2.5	Project sign boards	Lot	1						
17.2.6	Roads, sidewalks and parking	Lot	1						
17.2.7	Road and Fence lighting System, With all related equipment including Lighting fixture and terminal boxes, Steel lighting poles with related terminals, fuses, fixtures, lamps and etc. , cables and related accessories, distribution boards and etc.	Lot	1						
17.2.8	supply of 10,000 litre pressed steel water tank and connection to the existing water supply system including the foundation, pumping system and all accessories	Lot	1						
17.2.9	First aid facilities	Lot	1						
17.2.10	Ambulance facilities	Lot	1						
17.2.11	Drainage system	Lot	1						
17.2.12	Sewage system	Lot	1						
17.2.13	Site Toilets	Lot	1						
17.2.14	Watch and ward and access control to site during construction	Lot	1						
	TOTAL PRICE ITEM 17								
18	FACTORY ACCEPTANCE TESTS								
	Provision as per Employers Requirements: - Part 2-A, Clause 18.1; and - Part 2-B, Relevant Clauses for Testing and Inspection								
18.1	Power transformers FAT	Lot	1						
		Lot							
18.2	Auxiliary transformers FAT	Lot	1						
		Lot							
18.3	Instrument transformers FAT	Lot	1						
18.4	Circuit breakers FAT	Lot	1						
		Lot							
18.5	Disconnectors & earth switches FAT	Lot	1						
		Lot							
18.6	Surge arrestors FAT	Lot	1						
		Lot							
18.7	Conductors, shield wires, OPGW, clamps and connectors FAT	Lot	1						
18.9	Protection, Control & Metering Panels FAT	Lot	1						
		Lot							
18.1	Substation Automation and Control System FAT	Lot	1						
18.11	Telecommunication Equipment FAT	Lot	1						
18.12	110Vdc, 48Vdc Batteries, Battery Chargers and UPS FAT	Lot	1						
18.13	AC and DC Distribution Panels FAT	Lot	1						
18.14	Diesel Generator	Lot	1						
18.15	Gantries, Steel Structures and Accessories FAT	Lot	1						
	TOTAL PRICE ITEM 18								
19	TRAINING								
	Provision as per Part 2-A, Clause 28.3 of Employers Requirements								
19.1	Off Shore Training								
19.1.1	Substation Equipment Design Training (2 Design Engineers and 1 TSP Engineers for 3 weeks)	Lot	1						
19.1.2	Protection and Control for Electrical Power Systems (4 Engineers for 3 weeks)	Lot	1						
19.1.3	Power System Analysis (2 TSP Engineers for 2 weeks)	Lot	1						

19.1.4	Communication & Substation Control System– Application & Design (2 Design Engineers for 2 weeks)	Lot	1						
19.1.5	Civil/ Structural Design Training (for 2 Design Engineers and 1 TSP Engineers for 3 weeks)	Lot	1						
19.2	On shore Training								
19.2.1	Site Operation and Maintenance Training for atleast 10 Engineers for 2 weeks	Lot	1						
	TOTAL PRICE ITEM 19								
20	INTERNSHIP & GRADUATE EMPLOYMENT								
	Provision as per Part 2-A, Clause 27.4 of Employers Requirements								
20.1	Graduates Employment (2 Engineers)		24						
20.2	Graduate Internship (2 Engineers)		24						
	TOTAL PRICE ITEM 20								
21	Climate Change Impact Mitigation								
21.1	Climate Change Impact Mitigation as per Clause 30 Part 2-A- Scope & General Requirements: The contractor shall plant trees worth KES 5,000,000 or at least 30,000 trees whichever is higher	Lot	1						
21.2	CSR as per Clause 31 Part 2-A- Scope & General Requirements	Lot	1			10,000,000.00			
22	PRE-COMMISSIONING, COMMISSIONING AND END-TO-END TESTING								
22.1	Substation Pre-commissioning, commissioning and end-to-end testing including NCC/RCC/NSCC signaling and remote end relay settings modifications.	Lot	1						
	TOTAL PRICE ITEM 21								
	TOTAL PRICE SCHEDULE 4 KABARNET SUBSTATION								
	Note: Contractor shall include and consider all activities which are necessary to complete the project works (including construction, erection, installation, mobilization, site transportation and accomodation, modification, replacement, relocation, tests, pre-commissioning, commissioning, training, internship and etc. as required)								