



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY
OF ROUTERS, FIBER OPTIC CABLES,
TOOLS AND ACCESSORIES
- DETAILED TECHNICAL
SPECIFICATIONS

Doc. No. KP1/1.2B/1.3/3

Issue No. 1

Revision
No.

Commence
ment Date 2019-10-7

Page 1 of 20

LOT 1: FIBER OPTIC CABLES, TOOLS AND INSTALLATION ACCESSORIES

1. TECHNICAL SPECIFICATIONS FOR THE FIBER OPTIC CABLE AND FIBER INSTALLATION ACCESSORIES

The fiber optic cable, installation accessories and fiber patch cords in the schedule of requirements shall conform to the minimum requirements below;

1.1. FIBER OPTIC CABLE & INSTALLATION ACCESSORIES

1.2. ADSS Fiber Optic cable 48 core single mode (9/125)

The ADSS optical cable shall be of non-metallic Aerial type designed for installation on distribution lines of 66Kv, 33Kv and 11Kv distribution lines with minimum span lengths of 100 meters. The Bidder shall offer ADSS containing 48 Nos. of Single Mode (SM) optical fibers in conformity with ITU-T recommendations G-652D. The cable shall be designed to withstand all prevailing environmental conditions including the effects of high electric and magnetic fields produced by the proximity of live power conductors and meet the requirements of International Standard IEEE P1222.

1.1.1. Mechanical and Environmental specifications for 48 core SM (9/125) ADSS fiber optic cable

The cable shall be constructed from materials which have been technically proven and able to withstand the electrical and environmental conditions.

Table 1 below gives the desired mechanical and environmental specifications for the ADSS Fiber Optic Cable for minimum performance characteristics.

Table 1 Mechanical and environmental Specifications for 48 Core SM (9/125) ADSS Fiber Optic Cable

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

**TENDER FOR SUPPLY AND DELIVERY
OF ROUTERS, FIBER OPTIC CABLES,
TOOLS AND ACCESSORIES
- DETAILED TECHNICAL
SPECIFICATIONS**

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 2 of 20	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1	Manufacturer's Name & Country of manufacture		
2	Type Reference/Model Number of cable offered		
3	International recommended standard adhered to	1EEstd 1222, IEC 60794-4, IEC 60793-1, IEC 60793-2, IEC 60794-1, ITU-T G.652D, EIA 492A, EIA 472A, EIA 598 or ANSI/EIA 359-A-1985, ISO 9001 and ISO 14001	
4	Maximum inductive voltage (kV) that the cable can withstand as per technical specification.	66 kV	
5	Fiber counts	48	
6	Tube count	4	
7	Maximum Operating Load	6000 N	
8	Minimum Bending Radius Installation Long Term	20xO.D. 10xO.D.	
9	Maximum. Compressive Loading	4000 N	
10	Impact Resistance	4.4 J, 3 x 2 times	
11	Twist (Torsion)	10 turns of 180° on 125xO.D.sample, both ways.	
12	Storage Temperature Range	-50° C to +50° C	
13	Operating Temperature Range	-40° C to +50° C	
14	Core Fluid Penetration	1 m sample, 1 m water head for 24 Hrs	

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY
OF ROUTERS, FIBER OPTIC CABLES,
TOOLS AND ACCESSORIES
- DETAILED TECHNICAL
SPECIFICATIONS

Doc. No. KP1/1.2B/1.3/3

Issue No. 1

Revision No.

Commencement Date 2019-10-7

Page 3 of 20

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
15	Span (Distance Between Poles)	Greater than 150M	
16	Warranty	15 years	
17	UV Resistance	Excellent weathering and UV resistance	
18	Outer Cable Markings	Property of Kenya Power & Lighting Company	
19	Packing	Rolls of 4000M	
20	Length marking	Every meter	
21	Color of Cable	Black	
22	Performance	Allowed attenuation per Km for the 9/125 micron single mode fiber optic cable 1) 1310nm 0.4 dB/km 2) 1550nm 0.3 dB/km	
23	Fusion splice loss	Maximum allowed loss 0.1db	
24	Wind Speed	15m/s	
25	Jacket	PE for ADSS Cable AT for approach cable	

Manufacturer's Name, Signature, Stamp and Date

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019	Date: 28/10/19

 Kenya Power The Kenya Power & Lighting Co. Ltd.	TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES - DETAILED TECHNICAL SPECIFICATIONS	Doc. No.	KP1/1.2B/1.3/3
		Issue No.	1
		Revision No.	
		Commencement Date	2019-10-7
		Page 4 of 20	

1.1.2. Optic Fiber Approach Cable (OFAC)

The Optical Fiber Approach Cable (OFAC) shall have all properties similar to the ADSS Fiber Optic Cable. In addition the approach cable shall be of loose buffer type Optical Fiber Approach Cable (OFAC) of 48Fibers. The fiber optic approach cable shall be entirely suitable for laying through HDPE pipe in the cable ducts and on cable trays. The cable shall comprise of a tensile strength member, fiber support/bedding structure, core wrap/bedding and over all impervious jacket. No intermediate joints shall be permitted in any run of approach cable between its two termination points. The cable sheathing shall have additives to prevent rodent attack.

The fiber optic approach cable shall have a minimum outer jacket thickness of 3.0 millimeters and shall meet the following requirements.

- i. Fire retardant and no acid gas evolution.
- ii. Resistance to ultra-violet deterioration.
- iii. Anti-moisture penetration.

1.1.3. Universal Pole clamps

The Universal pole clamps shall be used for securing the ADSS Fiber Optic Cable below power lines on wooden or pre-stressed/reinforced round concrete poles. The clamps shall therefore be suitable for continuous operation outdoors in tropical areas at altitudes of up to 2200m ASL, humidity of up to 95% and average ambient temperature of 30°C with a minimum of 7°C and a maximum of 40°C in direct sunlight.

The Universal pole clamps shall be of two types; a fixed clamp type to fit poles of the range 210-240mm in diameter and an adjustable type that is designed to adapt to circular concrete poles tapering at 13mm per meter. The clamps shall be fabricated from structural steel of grade Q235 as specified in the BS 4360 or its equivalent and shall be zinc plated hot dip galvanized to give it a corrosion resistance finish in accordance with ISO 1461. The tensile strength of the Universal clamp shall not be less than 70kN. Figure 1 and Figure 2 below give sample images of the fixed size universal pole clamp and the adjustable universal pole clamps respectively. The tenderers should attach drawings/catalogues for their proposed clamps.

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019	Date: 25/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 5 of 20	



Figure 1 Universal Pole Clamp

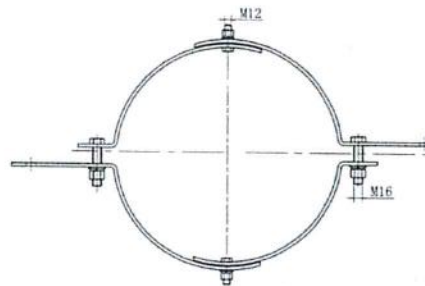


Figure 2 Adjustable Universal Pole Clamp

1.1.4. Suspension clamps

The ADSS optical cable suspension clamp unit shall be used for inline suspension of the ADSS Fiber Optic Cable. It shall provide long term performance for spans of up to 250m. It shall consist of a light Aluminum (or an Aluminum alloy) housing with rubber bushings capable of gently gripping the ADSS Fiber cable in it. The suspension clamp shall be held with a Clamping Bolt that allows the Suspension Clamp to hinge open into the rubber bushing during installation. The Aluminum housing shall be attached to an eye chain link. The Eye chain link shall in turn be attached to an anchor shackle for assembly to the Universal clamp (supplied separately). Figure 3 and Figure 4 below give illustrations of the suspension clamp fitting assembly and the suspension clamp aluminum housing respectively.

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES - DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 6 of 20	

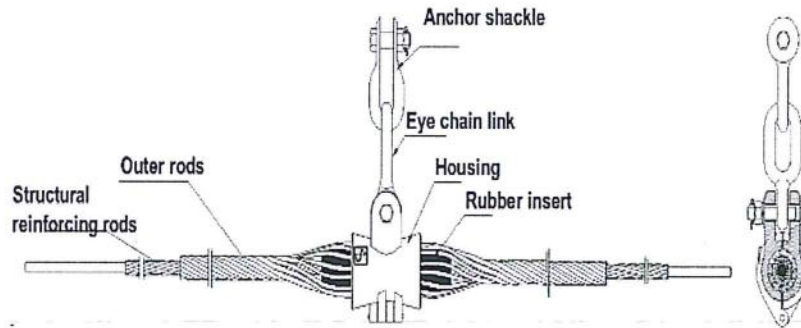


Figure 3 ADSS Suspension Fittings

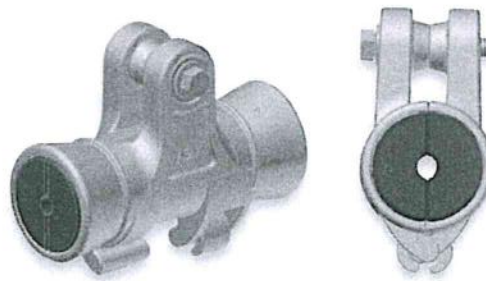


Figure 4 ADSS Suspension clamp housing showing the bushing

Table 2 below gives the desired specifications for the suspension clamp for minimum performance characteristics.

Table 2 Minimum requirements for Suspension clamp set

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	Span Length Rating	250 meters	
2.	Vertical Load Rating	2.25Tonnes	
3.	Torque Requirement	Mounting bolt should be tightened to 35Nm	
4.	Mounting Hardware	5/8" eye chain link and anchor shackle shall be included in the assembly	
5.	Line Angle	Max line angle of 30 degrees	

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019	Date: 28/10/19



Kenya Power
The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- **DETAILED TECHNICAL SPECIFICATIONS**

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 7 of 20	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
6.	Slip Strength	6% to 10% of Recommended breaking Strength of the ADSS Fiber Optic Cable	
7.	Bushing Color	Black	
8.	Drawings	The tenderer shall attach drawings for the proposed suspension clamps.	

1.1.5. Tension clamp

The tension clamp shall be used for suspension of the ADSS Fiber Optic Cable in tension at cable sections, acute turnings or at the terminal pole. It shall consist of an anchor, a shackle, thimble and galvanized pre-formed guy grip of suitable length as shown in Figure 5 below. It shall be made of materials similar to the suspension clamp.

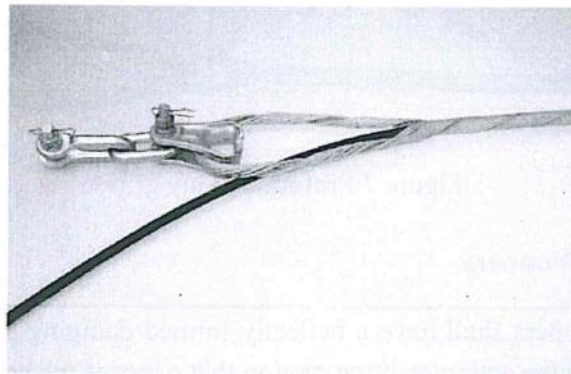



Figure 5 Tension Clamp/Dead End assembly

1.1.6. Protection rod

The protection rod or armor rod shall be designed to protect the OFC by reducing bending, compression, and abrasion at the support points. It shall be made of suitable aluminum-based material that is capable for use on ADSS OFC as shown in Figure 6 below.

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019.	Date: 28/10/19

 Kenya Power The Kenya Power & Lighting Co. Ltd.	TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES - DETAILED TECHNICAL SPECIFICATIONS	Doc. No.	KP1/1.2B/1.3/3
		Issue No.	1
		Revision No.	
		Commencement Date	2019-10-7
		Page 8 of 20	

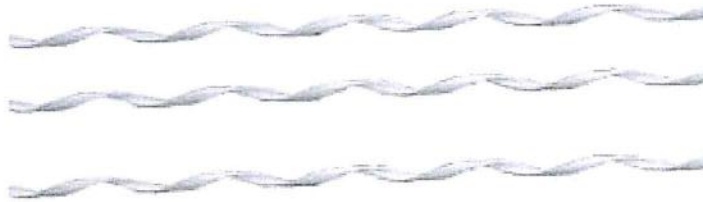


Figure 6 Protection or Armor rod

1.1.7. Preformed Guy grips

The preformed guy grip is intended for use together with the tension clamp to provide tension breaks at regular intervals on the Fiber Optic cable route. It shall be made of suitable aluminum-based material that is capable for use on ADSS OFC. Sample preformed guy grip is shown in Figure 7 below.




Figure 7 Preformed Guy grip

1.1.8. Aeolian Vibration Dampers

The Aeolian Vibration Dampers shall have a helically formed damping section sized for interplay of damper and cable to provide the action/reaction motion that opposes the natural vibration wave. It shall have a smaller gripping section that gently grips the cable so that cable and fiber are not damaged or distorted and there is no optical signal loss. They shall be made of PVC Spirals suitable for use with the ADSS Fiber Optic cable. A sample of the Aeolian vibration damper is shown in Figure 8

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019.	Date: 28/10/19

 Kenya Power The Kenya Power & Lighting Co. Ltd.	TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES - DETAILED TECHNICAL SPECIFICATIONS	Doc. No.	KP1/1.2B/1.3/3
		Issue No.	1
		Revision No.	
		Commencement Date	2019-10-7
		Page 9 of 20	

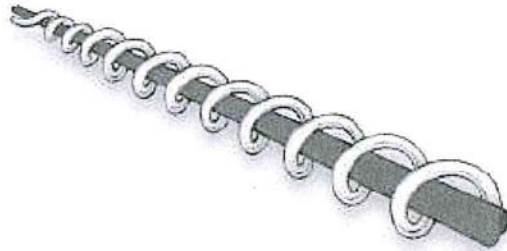


Figure 8 Aeolian Vibration Damper

1.1.9. Transformer by-pass Arms (Extension Arms)

The fiber glass extension arm shall be used to extend the ADSS fiber cable away from the pole line in instances where the pole carries power infrastructure that may interfere with the ADSS cable such as Air break switches, transformers and the like. Extension arm shall consist of base and end fittings that are made of aluminum alloy. The base and end fittings shall be connected using a fiber glass ferule that is tapered at 15° from the horizontal plane. The overall horizontal length shall be 91.4cm. A sample impression of the fiber glass extension arm is shown in Figure 9 below. The tenderer shall attach drawings for the proposed transformer by-pass arms.

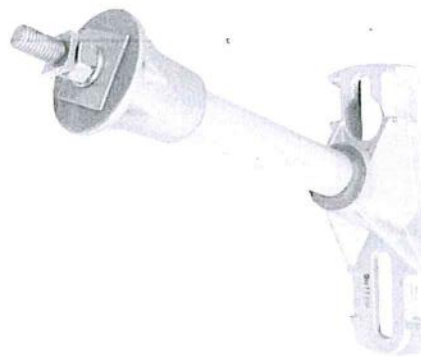



Figure 9 Fiberglass Extension arm

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019.	Date: 28/10/19

 Kenya Power The Kenya Power & Lighting Co. Ltd.	TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES - DETAILED TECHNICAL SPECIFICATIONS	Doc. No.	KP1/1.2B/1.3/3
		Issue No.	1
		Revision No.	
		Commencement Date	2019-10-7
		Page 10 of 20	

1.1.10. 4-way Splice Box - Plastic

The 4-way splice box shall be used for establishing joints in the ADSS Fiber Optic Cable. It shall be of the vertical type and shall provide for a minimum of 96 fiber terminations. It shall be of plastic material suitable for use in aerial, direct buried and/or underground cable joints. It shall provide a minimum of 4 cable out ports. Table 3 below gives a summary of the minimum requirements for the 4-way plastic splice box while Figure 10 shows a sample of the vertical plastic splice box complete with pole affixture.

Table 3 Minimum requirements for 4-way plastic splice box

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	Construction	Dome	
2.	Minimum cable out ports	4	
3.	Minimum fiber capacity	96 cores	
4.	Size	400x140mm	
5.	Material	PC Plastic	
6.	Sealing structure	Waterproof screw mechanical seal	
7.	Working Temperature	-40°C to 65°C	
8.	Relative humidity	Up to 85%	
9.	Application	Aerial, Direct buried, underground	
10.	Pole affixture	Adjustable pole mounting clips minimum diameter 210-240mm	
11.	Drawings	The tenderer shall attach drawings for the proposed splice boxes.	

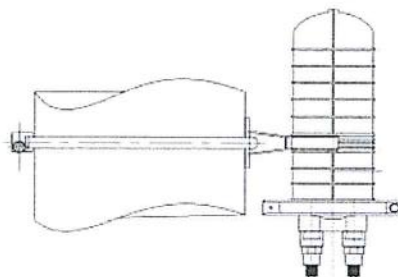


Figure 10 Plastic Splice/Joint Box

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019.	Date: 25/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 11 of 20	

1.1.11. FOC Storage Kit

The Fiber Optic cable (FOC) storage kit shall be used to manage the cable slack on the pole. It shall be made of same material as the universal pole clamps and shall be fabricated in the form of a cross arm and provided with suitable method to affix on the pole. The FOC storage kit shall have a minimum loop diameter of 2.5ft. The kit shall be supplied complete with the appropriate pole mounting straps to allow for mounting on the pole as illustrated in Figure 11 below. The tenderer to attach drawings of the proposed storage kits.

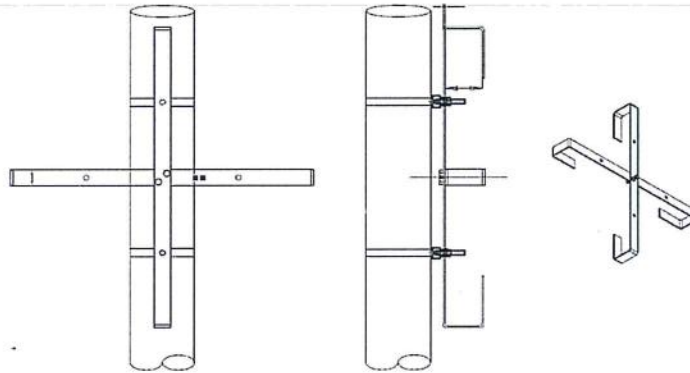


Figure 11 FOC Storage Kit Assembly

1.1.12. General Specifications for 48-Port Rack Mount Optical Distribution Frame (ODF)

This shall be a 48 port, 19" 1U Rack Mountable Optical Distribution Frame (ODF). It shall be used for the termination of the Fibers within a wall mounted or floor standing rack cabinet. The ODF shall be designed to provide protection for fiber splicing of pre-connectorized pigtails and to accommodate connectorized termination and coupling of the fiber cables. It shall be supplied complete with 48 port patch panel, SM pigtails with SC connectors, splice tray cassettes, splice sleeves and cable glands.

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019.	Date: 28/10/19



Kenya Power
The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- **DETAILED TECHNICAL SPECIFICATIONS**

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 12 of 20	

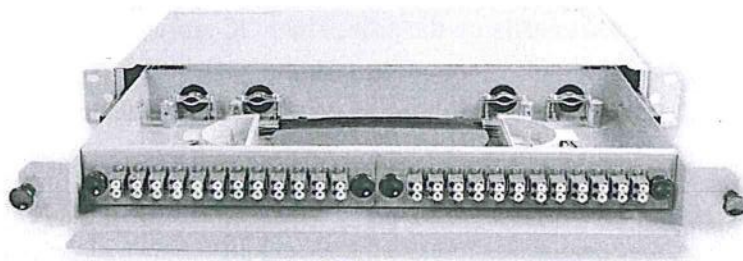


Figure 12 Rack mount Optical Distribution Frame (ODF)

1.2. FIBER OPTIC CABLE SPLICING ACCESSORIES

1.2.1. Splice Protection Heat Shrinkable sleeve

The Splice protection heat Shrinkable sleeves shall be of High Quality with OD=3.0 and L=60mm Fiber Optic Fusion Splice Sleeves Heat Shrink Tubes packaged in 100pcs per packet.

1.2.2. Self-fusing cable jointing tape

The cable jointing tape shall be composed of self-fusing, inorganic silicone rubber with an easy-tearing and easy-stripping polyester liner. The tape must be capable for continuous operation outdoors in tropical areas at altitudes of up to 2200m ASL, humidity of up to 95% and average ambient temperature of 30°C with a minimum of 7°C and a maximum of 40°C in direct sunlight. The tape must be compatible with all synthetic cable insulations as well as cable splicing compounds.

1.3. FIBER OPTIC CABLE MAINTENANCE EQUIPMENT

1.3.1. Portable Tent

This shall be a seven (7) foot tall pop up umbrella frame system with a UV resistant waterproof canvas or polyester material. It shall be of enough room to accommodate at least four (4) people, a table and

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019.	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 13 of 20	

four (4) chairs. It shall come with a mechanism to secure it on the ground that will prevent it from being carried away by wind. Table 4 below gives a summary of the minimum requirements for the portable tent.

Table 4 Minimum requirements for Portable tent

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	Minimum number of sides	4	
2.	Frame construction	pop up umbrella frame system with reasonably tough material for use in rugged terrain and in tough environmental conditions	
3.	Wall material	UV Stable Canvas/polyester material	
4.	Weight	<10kg	
5.	Maximum height	7ft	
6.	Inside room	Enough to accommodate at least four (4) people, a table and four (4) chairs	

1.3.2. Portable chair

This shall be a foldable and easily portable chair. Table 5 below gives a summary of the minimum requirements for the portable chair which is also illustrated in Figure 13.

Table 5 Minimum requirements for Portable Chair

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	Seat & back rest Material	Plastic	
2.	Frame structure	Tubular Steel	
3.	Side support	Steel Frame Supports	
4.	Coating	Rust proof Coated Frame Finish	
5.	Folded Size	19.25"W x 6.5"D x 42"H	
6.	Minimum carrying capacity	150kg	

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019.	Date: 28/10/2019


 <p>Kenya Power The Kenya Power & Lighting Co. Ltd.</p>	<p>TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES</p> <p>- DETAILED TECHNICAL SPECIFICATIONS</p>	Doc. No.	KP1/1.2B/1.3/3
		Issue No.	1
		Revision No.	
		Commencement Date	2019-10-7
		Page 14 of 20	



Figure 13 Foldable portable chair

1.3.3. Portable table

This shall be a foldable table, light weight in design but also sturdy. It shall be capable of quick set up and fast dismantling to fit into an easy carrying bag. The table shall have a smooth surface that can be cleaned easily. Should have four sturdy legs made of heavy gauge aluminum frame and fixed with non-skid rubber feet. Table 6 below gives a summary of the minimum requirements for the portable table.

Table 6 Minimum requirements for Portable Table

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	Frame material	Aluminum	
2.	size (LxWxH)	69.5cmx68.5cmx68.5cm	
3.	Carrying material	Bag	
4.	Table surface finish	water-resistant aluminum roll-up top	
5.	Construction	Foldable and easily portable	

1.3.4. Portable Generator

This shall be a portable, lightweight generator with the following technical characteristics.

Table 7 Minimum requirements for Portable Diesel Generator

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019.	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 15 of 20	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	MODEL	Tenderer to state	
2.	ENGINE TYPE	4-stroke, single cylinder, air cooled, gasoline	
3.	IGNITION SYSTEM	Transistor magneto	
4.	STARTING	Switch	
5.	FUEL TANK CAPACITY	6 Liters	
6.	CONTINUOUS OPERATION DURATION	9hrs	
7.	MAXIMUM OPERATING NOISE LEVEL	60 dB	
8.	FREQUENCY	50 Hz	
9.	VOLTAGE	220 V	
10.	MAX. AC OUTPUT	850 VA	
11.	RATED AC OUTPUT	750 VA	
12.	PHASE	Monophase	
13.	DIMENSIONS (L x W x H)	442x330x410 mm	
14.	DRY WEIGHT	28kg	
15.	Drawings/Datasheets	The tenderer shall attach datasheets for the proposed model.	
16.	Warranty	1 Year	

1.3.5. Cordless Hand Held Drill & Kit

The drill shall be a portable, battery powered, lightweight hand held tool that is capable of being used without being directly connected to a power sourcing using a cord. It shall be fitted with a hammer function that allows it to be used for making holes in wood, steel, non-ferrous metals, concrete, drywall as well as on plastics. The drill shall be supplied complete with its kit comprising battery charger, tool case and drill bits. Table 8 below gives the minimum requirements for the cordless handheld drill and the drill bits.

Table 8 Minimum requirements for Cordless Hand Held Drill

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed: 	Signed: 
Date: 25/10/2019.	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY
OF ROUTERS, FIBER OPTIC CABLES,
TOOLS AND ACCESSORIES
- DETAILED TECHNICAL
SPECIFICATIONS

Doc. No. KP1/1.2B/1.3/3

Issue No. 1

Revision No.

Commencement Date 2019-10-7

Page 16 of 20

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1.	Model	Tenderer to state	
2.	Motor type	Brushless	
3.	Power	18V Lithium-ion with integrated battery charger level indicator	
4.	Battery Size	4.0Ah	
5.	Battery Charge time	40 minutes	
6.	Chuck size	1/2inch	
7.	Torque	520lb	
8.	Tool case	Rugged plastic material suitable for protecting the drill from tough work environment	
9.	Drill bits	40 piece set compatible with 1/2inch drill	
10.	Drill bit performance	Contractor Grade Impact Drill-Driver Compatible	
11.	Drill bit durability	Made from S2 modified steel, and heat treated corrosion resistant Black Oxide coated finish	
12.	Drill bit packaging	Durable, compact storage case	
13.	Drawings	The tenderer shall attach drawings/data sheets for the proposed model.	
14.	Warranty	1 Year	

Prepared By: Assistant Engineer – Telecommunications - KPI

Signed:

Jkg.

Date:

25/10/2019.

Approved By: Ag. Deputy Director – Telecom Services - KPI

Signed:

[Signature]

Date:

28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY
OF ROUTERS, FIBER OPTIC CABLES,
TOOLS AND ACCESSORIES
- DETAILED TECHNICAL
SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 17 of 20	

LOT 2: INTEGRATED SERVICES ROUTERS, WAN INTERFACE CARDS, SFP MODULES, PATCH CORDS AND MAINTENANCE LAPTOP.

The Integrated Services router, WAN interface cards, SFP modules, Patch cords, and Maintenance laptops in the schedule of requirements shall conform to the minimum requirements below;

2.1. INTEGRATED SERVICES ROUTER, WAN INTERFACE CARDS, SFP MODULES AND LAPTOP DETAILED SPECIFICATIONS

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
1	Cisco ISR 4431 Router	Cisco 4431 integrated services router 3 Network interface Modules (NIM) slots 4 WAN or LAN ports- 10/100/1000 ports 4 SFP based ports 4 RJ-45 based ports 8 GB Flash Memory 2 GB DRAM -Data plane 4GB DRAM – Control plane 500Mbps aggregate throughput 1 USB console port 1 Serial Console port- RJ45 Dual Power supply: Primary and Secondary Combination of AC & DC power supply AC input voltage 100 to 240VAC DC input voltage 48V- 60V 3 year Cisco Smartnet Support to include 1-year Router Warranty	
2	EHWIC-1GE-SFP-CU CARD	Cisco Enhanced High-Speed WAN Interface Cards Cisco Gigabit Ethernet Dual-Identity Small Form-Factor Pluggable and Copper Enhanced High-Speed WAN Interface Card	
3	SFP modules	GLC-EX-SM Cisco Compatible 1000BASE-EX SFP, 1310nm DFB, 40km over single mode fiber	

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019.	Date: 25/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES
- DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 18 of 20	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
4		1000BASE-LX/LH (GLC-LH-SM) 1310nm, 10Km	
5	SFP modules <i>Must be compatible for use in ABB FOX 615/515 Multiplexers</i>	1000BASE-EX SFP, 1310nm, 30km over SMF, Rx sensitivity -25dBm, Dual LC connector	
6	Single Mode Media Convertors	Single Mode Media Convertors SC, 10/100Base TX UTP, 10/100 Base FX, SC type, support upto 30Km	
7		Single Mode Media Convertors 10/100Base TX UTP, 10/100 Base FX, SC type, support upto 60Km	
8	Single mode fiber patch cord	Single mode fiber patch cord LC-FC 20M	
9		Single Mode Fiber patch cord SC-SC 10M	
10		Single Mode Fiber patch cord SC-SC 20M	
11		Single mode fiber patch cord SC-LC 20m	
12		Single mode fiber patch cord SC-LC 5m	
13		Single Mode Fiber patch cord SC-SC 2m	
14		Single Mode Fiber patch cord SC-FC 10M	
15	CAT 6 UTP patch cord	CAT 6 UTP patch cord 10m	
16		CAT 6 UTP patch cord 5m	
17		CAT 6 UTP patch cord 2m	
18	Flexible conduits	25mm Flexible conduits, standard length of 30m	
19	Cable ties	Cable ties 200mmx 4.8mm	

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY OF ROUTERS, FIBER OPTIC CABLES, TOOLS AND ACCESSORIES

- DETAILED TECHNICAL SPECIFICATIONS

Doc. No.	KP1/1.2B/1.3/3
Issue No.	1
Revision No.	
Commencement Date	2019-10-7
Page 19 of 20	

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
20	Maintenance laptop	<ul style="list-style-type: none"> • Operating System: Windows 7 Professional/ Ultimate • Processor: Intel-Core i5-3360M • Memory: 4096 MB, DDR3 1600MHz; 761 MHz 10-10-10-27 timing <ul style="list-style-type: none"> • Display: 15.6 inch, 16:9, 1366 x 768 Pixel • Mainboard Intel QM77(Panther Point) • Storage: 7200 rpm SATA up to 500GB • Graphics Adapter: Intel HD Graphics 4000, Core: 350-1200 MHz, Memory : 800 MHz, 8.15.10.2639 • Battery: Minimum 97 Wh Lithium-Ion • Soundcard: Intel Panther Point PCH –High Definition Audio Controller • Ports: 1 Express Card 54mm, 2 USB 2.0, 2 USB 3.0 / 3.1 Gen1, 0 Firewire, 0 Thunderbolt, 1 VGA, 1 HDMI, 0 DisplayPort, 0 S-Video, 1 Kensington Lock, 1 eSata, 1 Docking Station Port, Audio Connections: 3.5mm combo, Card Reader: 5in1 (MMC/MS/MS-PRO/SD/SDHC), 1 Fingerprint Reader • Networking: Intel 82579LM Gigabit Network Connection (10/100/1000Mbit), Intel Centrino Advanced-N 6205 (a/b/g/n), Bluetooth 1 	

Prepared By: Assistant Engineer – Telecommunications - KPI	Approved By: Ag. Deputy Director – Telecom Services - KPI
Signed:	Signed:
Date: 25/10/2019.	Date: 28/10/19



Kenya Power

The Kenya Power & Lighting Co. Ltd.

TENDER FOR SUPPLY AND DELIVERY
OF ROUTERS, FIBER OPTIC CABLES,
TOOLS AND ACCESSORIES
- DETAILED TECHNICAL
SPECIFICATIONS

Doc. No. KP1/1.2B/1.3/3

Issue No. 1

Revision No.

Commencement Date 2019-10-7

Page 20 of 20

ITEM	DESCRIPTION	MINIMUM REQUIREMENTS	TENDERER'S OFFER
		<ul style="list-style-type: none">• Optical Drive: PLDS DVD-ROM DS-8D3H• Size: (1.38 x 15.26 x 10.7 in)• Camera: Webcam, HD• Maximum Weight: 2.87 Kg• Carrying bag: Should be supplied with a leather carrying bag• Tenderers to attach datasheets of the proposed model	

Prepared By: Assistant Engineer – Telecommunications - KPI

Signed:

Date:

25/10/2019

Approved By: Ag. Deputy Director – Telecom Services - KPI

Signed:

Date:

28/10/19