

11.6. Fiber Optic 6x core Multimode OM3 Outdoor Cable

	Description	Specification	Complied (Yes/No)	If Yes Bidders Response/ Reference Page	If No Bidders Response/Reference Page
Fiber Optic 6x core Multimode OM3 Outdoor Cable					
1	Manufacture				
2	Country of Origin				
3	Country /place of Manufacture				
4	Brand Name				
5	Model Number				
6	Construction characteristics				
6.1	Fiber optic type	OM3 50/125			
6.2	Optical Fibers	900um			
6.3	Cable Construction	Tight Buffer / Loose tube			
6.4	Outer sheath Construction	LSZH with UV resistant additive			
6.5	Insulation	Reinforced watertight glass yarns /Gel			
6.6	Strength Element	Central strength element / Corrugated steel tape armor			
7	Dimensional characteristics				
7.1	Number of optical fibers	6			
7.2	Nominal outer diameter	specify			
7.3	Approximate weight	specify			
8	Mechanical characteristics				
8.1	Mechanical resistance to impacts	specify			
8.2	Crush resistance	specify			
8.3	Maximum operating pulling force	specify			
8.4	Maximum pulling force	specify			

9	Usage characteristics				
9.1	Ambient installation temperature, range	specify			
9.2	Operating temperature, range	specify			
9.3	Storage temperature, range	specify			
9.4	Minimum static operating bending radius	specify			
9.5	Minimum dynamic operating bending radius	specify			
9.6	Flame Retardant	IEC 603321 & IEC 60332324			
10	Key Performance characteristics				
10.1	Effective Model Bandwidth	2000 MHz.Km			
10.2	10Gbit system Performance	Support 10Gbit-SR 330m			
10.3	Compliance Standard	IEC 60793, ISO/IEC 11801 ANSI/TIA-568C.3; ITU T G657			
11	Geometrical characteristics				
11.1	Core Diameter	$50 \pm 2.5 \mu\text{m}$			
11.2	Core Non-Circularity	$\leq 6.0 \%$			
11.3	Core/Clad Concentricity	$\leq 1.5 \mu\text{m}$			
11.4	Cladding Diameter	$125 \pm 1.0 \mu\text{m}$			
11.5	Cladding Non-Circularity	$\leq 1.0 \%$			
11.6	Coating Diameter	$250 \pm 15.0 \mu\text{m}$			
11.7	Coating/Clad Concentricity Error	$\leq 10.0 \mu\text{m}$			
12	Optical Parameters				
12.1	Bandwidth (Overfilled Launch) 850 nm	$\geq 1500 \text{ Mhz.km}$			

12.3	Bandwidth (Overfilled Launch) 1300 nm	≥ 500 Mhz.km			
12.4	Effective Modal Bandwidth (EMB) 850 nm	≥ 2000 Mhz.km			
12.5	Transmission link lengths for 1 Gb/s (SX/LX)	880/550 m			
12.6	Transmission link lengths for 10 Gb/s (SR/LX4)	330/300 m			
13.1	Transmission link lengths for 40 Gb/s (SR4)	100 m			
13.2	Transmission link lengths for 100 Gb/s (SR4)	70 m			
13.3	Attenuation 850 nm	3.0 dB/km			
13.4	Attenuation 1300 nm	1.0 dB/km			
13.5	Attenuation uniformity	≤ 0.2 dB			
14.1	Numerical Aperture	0.20 ± 0.02			

11.7. Patch Cord Multimode

	Description	Specification	Complied (Yes/No)	If Yes Bidders Response/ Reference Page	If No Bidders Response/ Reference Page
	Patch Cord Multimode 50/125 OM3 2m LC – to SC				
1	Manufacture				
2	Country of Origin				
3	Country /place of Manufacture				
4	Brand Name				
5	Model Number				
6	Guarantees and installation				
6.1	Ethernet	1GBase-SX, 10GBase-SR, 25GBASE-SR			
6.2	Fiber channel Serial	4G, 8G, 16G and 32G			
6.3	Colour of Jacket	specify			

6.4	Installation	A1-B2, B1-A2			
6.5	Standard Performance	IEC 11801 and EN 50174-1:2009, IEC 60793-2-10, fiber model A1a.2b			
7	Construction characteristics				
7.1	Colour	specify			
7.2	Armour type	Aramid yarn			
7.3	Outer sheath	LSZH-FR			
7.4	Fiber optic type	OM3 50/125			
7.5	Connector type	Duplex SC-LC			
8	Transmission characteristics				
8.1	Insertion Loss, maximum, dB	0.25 dB (IEC 61300-3-4)			
8.2	Return Loss, maximum, dB	30 dB (IEC 61300-3-6)			
9	Mechanical characteristics				
9.1	Crush resistance	100 N/cm (IEC 60794-1-E3)			
9.2	Maximum pulling force	200 N(IEC 60794-1-2-E1)			
10	Usage characteristics				
10.1	Operating temperature, range -	-10 to 50 °C			
10.2	Minimum static operating bending radius	10 mm			
10.3	Fire retardant	IEC 60332-3 Cat.C			

11.8. Fiber Optic Patch Panel

	Description	Specification	Complied (Yes/No)	If Yes Bidders Response/ Reference Page	If No Bidders Response/ Reference Page
	Fiber Optic Patch Panel				
1	Manufacture				
2	Country of Origin				
3	Country /place of Manufacture				

4	Brand Name				
5	Model Number				
6	Application				
1	1U Optical Fibre Patch Panel has been designed to support	Up to 24 Dual SC adaptors.			
7	Features				
7.1	Width	19"			
7.2	Version	SC			
7.3	positions :	front: flush, recessed			
7.4	Easy identification	numbered on the face plate.			
7.5	Cage-nuts and fibre holders	Included			
8	Construction characteristics				
8.1	Connector type	Support both Dual SC & LC			
9	Dimensional characteristics				
9.1	Height	1 U			
9.2	Width	19 in			
9.3	Depth	310 mm			
10	Usage characteristics				
10.1	Component function	Patch panel			

11.9. Fiber Pigtails

	Description	Specification	Complied (Yes/No)	If Yes Bidders Response/ Reference Page	If No Bidders Response/ Reference Page
	Pigtails				
1	Country of Origin				
2	Country /place of Manufacture				
3	Brand Name				
4	Model Number				

5	Standards Performance	International ISO/IEC 11801 , IEC 60793210			
6	Pigtail family characteristics				
6.1	Available connectors	SC			
6.2	Suitable for use	Patch panels using splice cassettes.			
6.3	The pigtails can be stripped	In one action over a long distance of up to 1m			
6.4	Insertion loss	Typical value is 0.1 dB, maximum value is 0.25 dB.			
7	Optical Performance Pigtails				
7.1	Fiber Type : Multimode	Connector : SC			
		Insertion loss max. : 0,25 dB			
		Return loss min. : > 30 dB			

Implementation Guide Lines

Termination, Labeling, Testing of a UTP/Fiber Network Node Cabling, WAP and Network Equipment Installation					
1	Installation Guidelines	The Fiber and UTP Cables with conduits and casing shall be clipped to the concrete slab or wall and shall not be laid on top of the ceiling.			
		All network cables and accessories should be reputed same brand. do not quote duplicate brand.			
		During the underground fiber cable laying conduct the duct route survey and inspect the route for manhole, coiling, splicing locations. Ensure there are no sharp bends or slopes that exceed the minimum bend radius of the cable.			

		Fiber (Fusion Splicing) and UTP Network nodes should be terminated on patch panels.		
		The Fiber and UTP cables have to be laid from the patch panel to the keystones/user end.		
		The access point shall be connected to the keystones.		
		Installation of Fiber and UTP cables shall not be closer to power cables and water lines.		
		Installation of Fiber and UTP cables shall be free of Testing and Report (OTDR and Fluke)		
		The Fiber and UTP cables shall be tied up loosely together with sufficient distance.		
		WAPs should be properly wall / ceiling mounted.		
		All network equipment shall be mounted on the rack in a proper order.		
2	Inspections and Tests	Structured cable test report should be prepared for each individual building floors. The report should cover all cable points from the rack to the end user point.		
		Wireless Access Point coverage and signal strength test report should be prepared for each individual building floors.		
		If the supplier identifies requires additional equipment other than the requested amount network equipment's, supplier should submit a report with justifications to the purchaser.		
		A drawing of the locations comprising of the final access points installed should be submitted to the heads of the respective divisions of the purchaser.		
		The final network equipment configuration report and backup		

		settings should be submitted to the purchaser.		
		<p>If the supplier should do following Works.</p> <ul style="list-style-type: none"> • Testing, numbering & rearrange, patch cord replace the existing server racks & other racks • Testing, numbering of the rearrange, relocate of exiting Data & Voice Outlets. 		
3	Warranty	25years comprehensive on-site manufacturers authorized warranty, inclusive of replacement of all defective parts free of charge for the above mention all items.		

4. Drawings

Scope of Work for Fiber Laying and Related Civil Works

The proposed Fiber Optical Backbone should be scalable for future requirements and interoperable with other systems. This system shall have the capability of running many services such as Voice, Datatec.

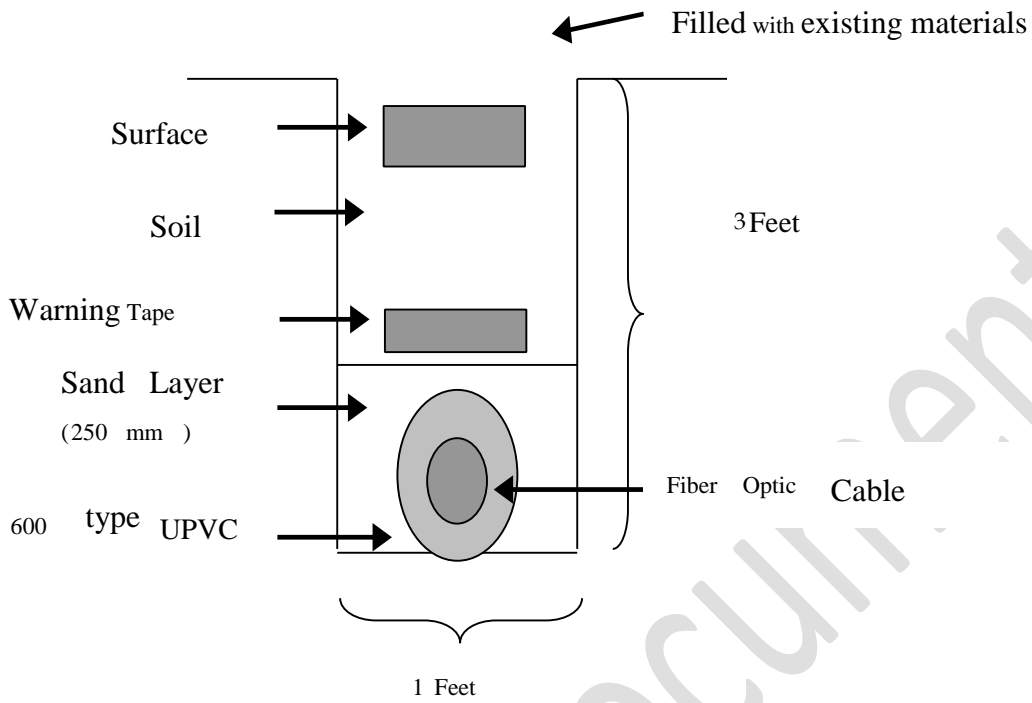
The scope work shall include the following:

1. All Fiber Optical Cores should be terminated with mode Pigtails using Fusion Splicing Technology
2. All Indoor Fiber Optical Cables should be laid in electrical conduits
3. All outdoor Fiber Optical Cables In between manholes, laid UPVC 4” type-600 (A spare draw wire should be installed in each cable duct).

Other fiber lines should be laid with the UPVC 2” type-600.
4. Complete backfilling and compacting the entire excavation path and all related civil works should be carried out without additional cost.
5. All Warning Tapes used should be 3” width, with at least a thickness of 4mil and should be printed “**Fiber Optic Cable Below**” (or similar) continuously.
6. As per site condition which needs to be agreed upon with the department a 3(W)x3(L)x3(D) (feet) manhole should be constructed with concrete(Density 4”)and should be protected with a class Double Seal**B125/D400(BS EN 124:2015)**rated access cover. **Keep 2 m fiber cable in both side of the man hall**
7. Fiber paths in should have a warning tile installed on surface every 10m with the Marking (embossing) “**Fiber Cable**”.
8. All armored fiber optical cables should be grounded as per **BS 7430:2011** Code of practice for protective earthing of electrical installations industrial standards.
9. All damages to residential water lines and other similar infrastructure damaged during excavation should be completely repaired with no additional cost to the department.

10. At all building entry points of the fiber optical backbone a 2x2(feet) hand hole should be constructed and should be protected with a class **B125/D400(BS EN 124:2015)** rated access cover.
11. Verification, qualification and certification should be done using industrial standards tool after each fiber cable installation. The report should be given in original format.
12. All equipment including cables should be labeled using industrial standard labeling format.
13. Bidder should bare the variation cost
14. Bidders should be check and take actual measurements by visiting the sites before quote the price.

A. Fiber Cable Laying Structure



B. Cross Section of the Manhole

