

TECHNICAL REQUIREMENTS & SPECIFICATIONS

Item Code	Description
1083800	Maintenance Free Earth Electrode
Maintenance Free Earth Electrode	Supply of Maintenance Free Earth Electrode of length 3m, including supply of 3 bags of Earth enhancement material for earthing (10KGs /bag) for each electrode & other accessories as per Drg. No. SDO / RDSO/ E&B/001 and RDSO Spec No. RDSO / SPN/197/2008.
Inspection By	RDSO

1047	6 Core armoured Cable
Cable Type	Single Mode, 6 Core, Armoured Optical Fibre Cable
Core Count	Minimum 6 Mono Mode Fibres
Nominal Core Diameter	8.8 µm to 9.8 µm
Cladding Diameter	125 µm ± 1 µm
Cable Construction	Armoured, suitable for underground/outdoor use
Approved Makes	Molex, Paramount, D-Link, Plexonics, Finolex, Orient, Polycab, Usha Martin
Standard	As per applicable RDSO / TEC specification

1004	STP Cat-6 Cable
Cable Type	Shielded Twisted Pair (STP), Category 6
Conductor	100% Solid Bare Copper
Conductor Size & Material	23 AWG Annealed Bare Solid Copper
Pairs	4 Pairs (8 Conductors)
Shielding	Overall Aluminum Foil Shield
Compliance Standards	TIA/EIA-568-C.2, ISO/IEC 11801
Color Code	ANSI/TIA-568-B.2 Standard Pair Color Code
Outer Diameter	6.0 – 7.5 mm (typical)
Packing	Tangle-free cable pack in pull-free corrugated box

1005, 1024	Fibre Distribution Management system (FDMS)/LIU for 12 Fiber
Type	Wall Mountable / Rack Mountable (19" or 21") – as
Fiber Capacity	12 Fiber Terminations (SC/LC/FC/APC as per requirement)
Splicing Type	Fusion Splicing with Splice Holder for 12 fibers
Number of Adapters	12 Nos. SC/APC Simplex / LC Duplex Adapters (Single-mode or multi-mode, as required)
Fiber Management	Internal fiber routing guides and bend radius control (min. 30 mm)
Cable Entry Ports	Minimum 2 cable entry ports with rubber grommets
Pigtails	12 Nos. of factory-tested pigtails, min. 1.5-meter length
Splice Tray	At least 1 splice tray with capacity of 12 core fusion splices
Material	Powder-coated CRCA steel / Aluminum (minimum 1.2 mm thick)
Color	RAL 7035 or Black powder-coated
Mounting	Suitable for wall mounting or standard 19"/21" rack mounting
Front Door	Transparent acrylic/metallic door with lock
Protection Level	IP-55 or better
Operating Temperature	-10°C to +60°C

1008	Rigid PVC Conduit Pipe
Colour	White/Grey/Cream
Nominal Diameter	1 Inch
Outer Diameter	25 mm
Inner Diameter	22.5 mm
Standard	IS: 9537 (Part 3)
Pipe Length	3 meters per piece
Wall Thickness	Approx. 1.25 mm
Material Grade	High Impact Resistant PVC
Surface Finish	Smooth inner & outer surface
Accessories	Bend & Elbow as per site requirement
Installation Type	Surface / Concealed

1009	Galvanized Iron Hot dipped Power Coated Perforated Type Cable TRAY, Size 100 mm
Minimum Size	100 mm x 50 mm (next higher size permissible if required size unavailable)
Thickness	Minimum 1.5 mm – perforated type
Material	Galvanised Iron (GI), Hot-dipped, Power Coated, Perforated
Standard	EN ISO 1461
Fixing Support	Angle brackets at maximum 1 metre interval; nut, bolt, clamp or welding as per site

Clamping	Proper clamping arrangement for cables laid on tray
Fixing Material	Brackets, nuts, bolts, clamps included; no extra payment for fixing materials

1011	19" 42U Rack
Rack Structure	The 19" rack structure width shall be 800 mm and depth 800 mm, made of 1.6 mm thick mild steel.
Front & Rear Door	One front glass door of 4 mm thickness covering full height, fixed with silicone sealant. Front and rear door frame thickness shall not be less than 0.9 mm, with approx. 180° opening, locking arrangement, detachable and interchangeable hinges, and polyurethane gasketing. Single key locking on all sides.
Accessories	Cable manager, 24-port RJ45 CAT6 patch panel and four equipment trays/shelves or as per site requirement.
Top & Bottom Cover	Top cover and bottom base thickness shall be minimum 1.2 mm. Top cover shall have 40 mm diameter cable entry holes with rubber rings and gland closure plates.
Side Panels	Detachable and ventilated side panels with flush-fitted air filters up to one-third height to prevent dust entry.
Power Distribution	AC power distribution channel with four 5-pin, 5 Amp sockets with common fuse and indicator. Industrial quality sockets of Legrand/Crabtree/Anchor/Zodiac make. Two numbers per rack with 3-core, 3 m mains cable and 15 Amp plug. Sockets mounted vertically on PVC base at rear side.
Castors	Heavy-duty castors comprising two with brake and two without brake, mounted on a separate plate.
Cooling Fans	Four cooling fans of Hicool make or superior, rated at 230 V AC, fitted inside the top cover with supply cable and plug.
Cable Management	PVC cable channel of size 45 (H) x 800 (W) mm for full rack length. One 19" cable manager with five hooks. Cable guides, ties, tie holders and cable markers for easy identification and lacing.
Earthing Arrangement	One copper earthing bar/strip with tin plating of cross-section 1" x 1/4", mounted horizontally on rear side for full 19" width with suitable tapping.
Finish	Complete rack structure shall be powder coated in combination of dark and light grey shades. Door frames shall be in light grey shade.
Mounting Hardware	Front panel mounting hardware set (cup washer, cage nut and M6 screw), 20 numbers per rack.
MCB Panel	MCB panel (without MCB) at top of rack for minimum 10 MCBs with positive and negative bus bars for DC power supply.
Approved Makes	Valrack / President / Rittal / Netrack / TATA / AE Connect / CP Plus make.
Shelves	Minimum two shelves shall be provided with each rack.
Installation	Complete standard Installation, Testing & Commissioning As per site conditions and requirements, proper fixing with required accessories in an adequate manner.

1013	OFC Modern Tool Kit
Fiber Optic Stripper	3-hole precision stripper (250µm/900µm/2-3mm):- 1 No.
Kevlar Cutter	Industrial grade Heavy-duty Kevlar yarn cutter:- 1 No.
Cable Jacket Stripper	Industrial grade OFC outer sheath stripper/slitter (Longitudinal Stripper):- 1 No.
Fiber Cleaver	Industrial grade High precision cleaver (<0.5° angle):- 1 No.
Side Cutting Plier	Industrial grade Insulated cutting plier:- 1 No.
Long Nose Plier	Industrial grade Fine grip plier:- 1 No.
Utility Knife	Industrial grade Heavy-duty cable cutting knife:- 1 No.
Cleaning Kit	IPA bottle + lint-free wipes + swabs:- 1 Set
Connector Cleaner	Pen-type fiber optic cleaner:- 1 No.
Fusion Splice Sleeves	40mm protection sleeves:- 2 packets

Electrical Tape	Standard insulation tape:- 2 Nos.
Cable Ties & Labels	Assorted sizes:- 1 Set
Visual Fault Locator (VFL)	Minimum 30 milliwatt capacity and range minimum 30 km range red laser FC/SC-APC/ST compatible, 630 nm to 650 nm (Visible Red Light), Make Fluke / Grandway / EXFO :- 1 No.
Optical Power Meter (OPM)	-70 to +10 dBm range:- 1 No.
Carry Case	Rugged toolkit box:- 1 No.
Bare Fibre	Bare Fiber Connector for Open OFC Cable:- 1 No.
Hexa Blade	Hexa Blade with Proper handle:- 1 No.

1014	Iron Cage
Item	Iron Cage for Protection of Cameras
Material	Mild Steel (MS)
Construction	Rigid welded construction
Design	Open grill / mesh type without obstructing camera view
Camera Compatibility	Suitable for 4K / PTZ / Fixed CCTV Cameras
Movement Clearance	Adequate clearance for camera pan / tilt / zoom / operation
Finish	Anti-rust primer with powder coating
Mounting	Wall / Pole / Bracket mounted
Fixing Accessories	Nuts, bolts, clamps and required mounting accessories included
Safety	Smooth finish with no sharp edges
Maintenance	Easy access for camera servicing and maintenance
Protection Purpose	Protection against physical damage, vandalism and accidental impact
Installation	Suitable for indoor & outdoor installation on walls, poles, buildings as per site requirement

1015	Power Line Protection Device (Class D) for Telecom Equipment Protection
Application	Suitable for protection of Telecom, Signaling and electronic equipment from surge voltage, transient overvoltage and induced lightning disturbances.
Protection Type	Class D surge protection device for sensitive electronic circuits.
Protection Features	Protection against lightning-induced surges, switching transients and electrical disturbances.
Response Characteristics	Fast acting surge suppression to minimize damage to connected equipment.
Construction	Industrial grade, flame-retardant and corrosion-resistant enclosure.
Mounting	DIN rail, panel mounting or equivalent standard industrial mounting arrangement.
Indication	Visual health/status indication for operational condition monitoring.
Earthing Requirement	Provision for effective grounding/earthing connection.
Environmental Conditions	Suitable for indoor Telecom equipment rooms and field installations under Indian climatic conditions.
Safety & Compliance	Conforming to relevant IEC/IS standards for surge protection devices.

1021	8 Port Switch
TTP Approval	Trusted Telecom Portal (TTP) approval and compliance with other applicable regulatory guidelines, if any, are mandatory
Item Description	08 Port Managed Ethernet Switch
Port Configuration	8 x 10/100 Mbps PoE Ethernet ports and 2 x 1000 Mbps SFP uplink ports
SFP Modules	02 SFP modules to be supplied along with switch
Switching Capacity	Minimum 20 Gbps
Packet Forwarding Rate	Up to 14.88 MPPS (64 byte packets)
VLAN Support	Support for 4K VLAN IDs, minimum 256 static VLANs, Voice VLAN and Video VLAN
PoE Standard & Budget	IEEE 802.3af and IEEE 802.3at compliant with minimum 120 W total PoE power budget
Surge Protection	Surge protection of 2 kV as per IEC/EN 61000-4-5
LLDP	IEEE 802.1AB LLDP and/or LLDP-MED support
Port Mirroring	One-to-one and many-to-one port mirroring
Security Features	Broadcast/Multicast/Unicast storm control, traffic segmentation, TLS, DoS attack prevention, 802.1X port-based access control, port security, ARP spoofing prevention, DHCP server screening, IP-MAC-Port binding, ARP inspection, DHCP snooping, 802.1X authentication with local and RADIUS database (IPv4 & IPv6)
Advanced Features	IPv4 and IPv6 inspection, SSH v2, IEEE 802.3x flow control
Management	Console port, Web-based GUI and CLI management
SNMP	SNMP v1, v2c and v3
Operating Environment	Operating temperature 0°C to 50°C; humidity 10%-90% non-condensing
Power Supply	100-240 V AC, 50 Hz
EMI Compliance	EMI compliance as per BIS / EN / FCC / CE
Installation	Its Includes standard installation as per instruction of Railway Site Engineer
Safety Compliance	Safety compliance as per BIS / UL / IEC / EN 60950 or latest

1022	24 Port Layer-2 Aggregate Switch
Applicable Standard	Aggregate Switch shall conform to RDSO/SPN/TC/65/2021 Rev.6.0 with latest amendments or latest applicable RDSO specification.
Trusted Telecom	Equipment shall comply with Trusted Telecom Portal (TTP) requirements and applicable Government of India guidelines.
Type	Managed Layer-2/Layer-3 Aggregate Ethernet Switch suitable for Railway Telecom Networks.
Port Configuration	Minimum 24 x 10/100/1000 Mbps RJ45 ports and 4 x 1G/10G SFP/SFP+ uplink ports.
Switching Capacity	Minimum 56 Gbps or higher.
Forwarding Rate	Minimum 41.7 MPPS or higher.
PoE Support	If PoE variant is supplied, minimum 370 W PoE budget with IEEE 802.3af/at compliance.
Flow Control	IEEE 802.3x Flow Control support.
VLAN Support	Support 802.1Q VLAN, Port-Based VLAN, Voice VLAN, Management VLAN and minimum 4094 VLAN IDs.
Spanning Tree	Support STP, RSTP and MSTP.
Multicast	Support IGMP Snooping v1/v2/v3 and IGMP Querier.
QoS	Support CoS, DSCP, SPQ, WRR/SRR, Traffic Shaping and Rate Limiting.
Security	Support SSH, HTTPS, 802.1X Authentication, TACACS+/RADIUS, DHCP Snooping, ARP Inspection, IP-MAC Binding, Storm Control and DoS Prevention.
IPv6	IPv4 and IPv6 ready from day one.
Management	Web GUI, CLI, Console Port, SNMP v1/v2c/v3, Syslog, NTP and TFTP.
Port Mirroring	One-to-One and Many-to-One Port Mirroring.
Jumbo Frames	Supported.
MAC Table	Minimum 16,000 MAC Address entries.
LLDP	Support LLDP and/or LLDP-MED.
Monitoring	Support sFlow/NetFlow or equivalent network monitoring.
SNMP Traps	Interface Up/Down, SFP Optical Threshold, STP Changes, LLDP Changes and Temperature Alarms.
Power Supply	100-240 VAC, 50/60 Hz with redundant internal power supply.
Rack Mounting	Suitable for standard 19-inch rack mounting with all accessories.
Operating Temperature	0°C to 50°C minimum.
EMI Compliance	BIS / EN / FCC / CE compliant.
Safety Compliance	BIS / UL / IEC / EN 60950 or latest equivalent safety standard.
Warranty	Minimum 3 Years OEM Warranty and Technical Support.

1023 Splicing of Fibers

Item Description	Splicing of Optical Fibre in OFC cable and making splice joint using contractor's own fusion splicing machine, tools, testing instruments and consumables. Rate applicable per single fibre splice as per Railway Telecom Tender.
Scope of Work	Fusion splicing of single mode optical fibres including preparation of cable, stripping, cleaning, cleaving, alignment, fusion, protection with heat shrink splice protector and placement in splice tray.
Methodology	Splicing shall be carried out by core alignment fusion splicer of reputed make ensuring splice loss within prescribed limits.
Standards	Work to conform to relevant ITU-T / TEC guidelines and Railway OFC maintenance practices.
Consumables	All consumables such as splice protection sleeves, cleaning tissues, IPA, cable ties, markers etc. to be provided by contractor.
Testing	Splice loss to be verified through splicer estimation and OTDR testing where required.
Acceptance Criteria	Average splice loss not to exceed 0.05 dB for SM fibre and no individual splice more than 0.1 dB unless approved by Engineer.
Tools & Equipment	Contractor shall arrange fusion splicer, cleaver, OTDR, power meter, light source and all allied tools.
Restoration	Proper dressing of fibres in tray, sealing of joint enclosure and restoration of cable sheath as per OEM practice.
Measurement	Payment shall be made on number of individual fibre splices completed and accepted.
Safety	Work to be done following Railway safety and block rules.

1033 Location Box for Fibers	
Type	19 inch IP-65 Rated 12U Outdoor Rack, Wall Mount / Pole Mount
Usable Height	12 U
Actual Width / Usable Width	572 mm / 19 inch
Actual Depth / Usable Depth	400 mm / 260 mm
Front Door	Steel door on hinges with gasket and locking arrangement
Operating Temperature	0°C to 85°C
Form Factor	LC/SC APC Coupler
Material Thickness	0.9 mm for rack and 1.2 mm for vertical equipment angles
Manufacturing Standard	Manufacturing process conforms to ISO 9001:2015 standards
Side Panels	Fixed side panels – 02 Nos.
Mounting Rails	19 inch wide adjustable mounting rails utilizing full width
Protection Level	IP65
Mounting Provision	Suitable for pole mounting and wall mounting
LIU Standard	24/48 Port SC/LC LIU (with pigtails)
Fitting Type	LIU/FDMS Type
No of Ports	512 minimum SC/LC Type
Optical Splitter (2:8)	04 Minimum SC APC Type
Optical Splitter (2:16)	04 Minimum SC APC Type
Features	Provisions for multiple cable management clips (front and rear) Accommodates splice trays and stackable cassette bracket

1012 Supply of 6A Double Pole (DP) MCB, 2 Module Width	
Rated Current	6 Ampere
Number of Poles	Double Pole (DP)
Rated Voltage	240V AC, 50 Hz
Breaking Capacity	Minimum 6 kA
Tripping Characteristic	Type C Curve
Standard	Conforming to latest IS/IEC 60898-1 or equivalent
Mounting	DIN Rail Mounting
Application	Protection against overload and short circuit in telecom, signalling, control and power circuits
Housing Material	Flame-retardant, self-extinguishing insulating material
Contact Material	Silver alloy or equivalent
Operating Mechanism	Quick Make, Quick Break with positive contact indication
Mechanical Endurance	Minimum 10,000 operations
Electrical Endurance	Minimum 4,000 operations
Protection Class	IP20 or better
Operating Temperature	-5°C to +55°C or better
Installation Location	Suitable for Railway telecom rooms, cable huts, relay rooms, station buildings and control panels
Supply Condition	Complete with mounting accessories and manufacturer's test certificate
Make	Any reputed manufacturer meeting specification and applicable standards
Warranty	Minimum 12 months from date of supply/acceptance, whichever is later

1010 & 1032 6 Meter CCTV Pole	
Item Description	Supply, Erection, Fixing, Testing and Commissioning of 6 Meter CCTV Smart Pole with Equipment Box suitable for Railway locations, Level Crossings, OFC Huts and Station premises.
Pole Type	6 Meter height galvanized steel tubular pole with tripod/guy wire support arrangement as required.
Pole Material	Hot Dip Galvanized Mild Steel conforming to relevant IS standards.
Pole Height	Minimum 6 Meter above ground level.
Pole Design	Suitable for mounting CCTV cameras, network equipment, junction boxes, antennas and accessories.
Wind Resistance	Suitable for wind load conditions as per IS 875 and local site conditions.
Surface Protection	Hot Dip Galvanized with minimum 80 micron zinc coating or better.
Equipment Box	Weatherproof IP65 rated outdoor equipment box for housing datacom/network equipment.
Equipment Box Material	Powder coated galvanized steel or aluminum construction.
Equipment Box Mounting	Pole mounted with lockable door and suitable cable entry arrangement.
Earthing	Provision of proper earthing arrangement for pole and equipment box.
Cable Management	Internal/External cable routing arrangement with protective conduit and clamps.
Foundation	RCC foundation of suitable size and depth as per site requirement and soil conditions.
RCC Work	Excavation, PCC, RCC, reinforcement, shuttering, curing and backfilling complete.

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Mounting Arrangement	Suitable brackets and fixtures for CCTV camera, network equipment and accessories.
Hardware	All nuts, bolts, clamps and accessories shall be galvanized and corrosion resistant.
Safety	Pole shall be structurally safe and suitable for continuous outdoor operation.
Operating Environment	Suitable for outdoor Railway environment, temperature 0°C to 55°C and humidity up to 95%.
Installation	Complete erection, fixing, alignment, grouting, testing and commissioning at site.
Inspection	Inspection by Consignee/RITES/Railway representative as specified in tender.
Warranty	Minimum 3 Years warranty against manufacturing defects.
Compliance	All materials and workmanship shall conform to relevant IS standards and Railway specifications.