



**GUJARAT INDUSTRIES POWER COMPANY LIMITED
SURAT LIGNITE POWER PLANT (SLPP)**

VOLUME II IT— Details for package A, B, C, D

Design, Engineering, Supply, and Construction of Package A, B, C & D
**New Lignite Feeding System, Associated Works, Contingency Feeding
Arrangement & Dismantling**

Tender No.: GIPCL/SLPP/R&M/LHS/FB-RE/LOCATION/EPC/2026

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Gujarat Industries Power Company Limited
Surat Lignite Power Plant (SLPP), Village: Nani Naroli, Taluka: Mangrol, Dist.: Surat,
Gujarat



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Broad Scope of Work – IT for EPC Contract

The objective of this scope is to **establish seamless, scalable, and reliable IT network connectivity** for new infrastructure locations and subsequently **dismantle and relocate existing IT infrastructure**.

General terms and condition

(The scope for IT Infrastructure under EPC contract primarily includes)

1. The bidder shall supply, install and commission the material as per Annexure - New Requirement.
2. The bidder should supply the material as per approved specification, make and model in Annexure - New Requirement. The bidder should ensure the make and model are same or higher and are compatible in Existing GIPCL Weigh Bridge system and other applications. The bidder shall have to take approval for final Make and model from GIPCL
3. The bidder should provide required equipment licences.
4. All network switches, wireless devices and other active network components shall be supplied with the latest stable OEM firmware available at the time of commissioning. Default passwords shall be changed before commissioning. Unused ports, services and protocols shall be disabled as per GIPCL IT guidelines. The bidder shall ensure that all supplied equipment is free from known critical security vulnerabilities at the time of commissioning.
5. The bidder should Establish robust wired (OFC) and wireless network connectivity from nearest GIPCL network to all New and Existing locations as per the requirements.
6. For underground cable laying the bidder should do proper trenching with minimum 1-meter depth.
7. For over ground cable laying the bidder should lay the cable in cable tray in structural manner.
8. The bidder should Ensuring seamless integration, redundancy and scalability.
9. The bidders are deemed to have visited the proposed work site to study the actual work condition.
10. The bidder shall prepare the logical network diagram, physical network diagram, OFC route diagram and other required diagrams and obtain approval from GIPCL before execution. Final As-Built documentation shall be submitted in accordance with Annexure-F.
11. The Bidder shall be solely responsible for all civil and electrical works required for the installation, relocation, and commissioning of the IT Infrastructure. This scope includes, but is not limited to: Foundations: Designing and constructing RCC foundations for equipment bases and necessary structural supports, Cable



- Routing: Trenching, backfilling and cable laying inside HDPE conduits, provide all necessary electrification works.
12. The bidder shall depute senior engineer to coordinate this expansion work and the engineer shall submit the end of day progress report to GIPCL IT.
 13. The bidder should submit daily progress reports.
 14. The bidder should extend structured electrical and network LAN to each IT endpoint Location.
 15. The GIPCL IT team shall provide the authorized IP schema. The bidder shall be solely responsible for configuring all newly supplied and relocated network switches, routers, and access points strictly according to this schema. Any network disruptions caused by unauthorized IP assignments shall be rectified by the bidder.
 16. The bidder should ensure minimum 99.5% uptime for operational network.
 17. A wired or wireless network must be established for the connecting location from the existing locations. (including the Vastan Site Office, VTC, 25 MW Solar plant office, etc.) prior to the execution of Package D.
 18. The bidder should shift the existing IT infrastructure from Vastan Feeder, WB's, Stock areas and other locations as per direction of IT.
 19. The bidder should provide minimum 3 years comprehensive onsite warranty with OEM support and spares availability.
 20. The bidder shall provide minimum 5% spare quantity of RJ45 connectors, I/O modules, OFC patch cords, SFP modules and other passive networking accessories supplied under this project. The spare materials shall be handed over to GIPCL IT during final project handover without any additional cost.
 21. The bidder shall submit OTDR Test Reports, LAN Certification Test Reports, Wireless Link Performance Test Reports, Failover Test Reports, End-to-End Connectivity Verification Reports and Application Accessibility Verification Reports in the prescribed format as defined in Annexure-G.
 22. The bidder shall submit Commissioning Reports along with Asset Registers, User Manuals, Administration Manuals, Troubleshooting Guides, Port Mapping Documents, Cable tagging and As-Built Documentation as defined in Annexure-F.
 23. Upon successful installation, re-installation and commissioning of each package, the bidder shall provide 30 calendar days of continuous, 24/7 onsite 'Hypercare' support. During this period, the bidder's senior engineer must remain dedicated exclusively to immediate troubleshooting and stability monitoring at the site.
 24. Final Project Acceptance and sign-off shall only be granted after: (a) Successful submission and verification of all manuals, reports, and asset registers, and (b) 30 consecutive days of completely error-free network operations under full production load, validated in writing by GIPCL IT. The bidder should submit the details for Warranty Support & Escalation Matrix as per Annexure-H.
 25. Subletting of the IT work (Fully/Partially etc) shall be concurred with due approval of GIPCL only
 26. Wording and understanding of the tender clause interpretation shall be as per GIPCL Only.



27. The bidder shall have to follow all the rules and regulation of GIPCL and the work shall be done as directed by GIPCL IT professionals.



Package (A, B and C): Network Connectivity Establishment and IT Infrastructure Installation

Establishment of Wired Network Connectivity (OFC Backbone)

The bidder shall design, supply, install and commission **10 Gbps Optical Fiber based network** from nearest existing GIPCL network to new locations.

Package A Establish OFC base Network connectivity at below Locations

1. JNT13(Existing building)
2. Proposed Feeder Breaker area
3. New MCC(Existing building)
4. Proposed MCC
5. New PCH(Existing building)
6. Existing Apron Porta Cabin
7. Internal structural networking

Package A Scope Includes

1. The bidder shall supply, install and commission the material as per Annexure - New Requirement.
2. The bidder shall supply the material as per approved make and model in Annexure - New Requirement.
3. The bidder should lay OFC cables through HDPE conduit including trenching.
4. The bidder should lay STP cables through HDPE conduit including trenching.
5. The bidder should properly do all OFC splicing and termination of OFC cable inside LIU inside the Rack. After termination the OTDR testing report should be taken.
6. The bidder should properly do all Installation of Network Rack, LIU, Switches, I/O with Face plate, Enclosure box, etc end to end structural networking at all locations.
7. The bidder should provide LAN & Structured Cabling Infrastructure by establishment of STP Cat6 structured cabling network
8. The bidder should ensure Connectivity to all field endpoints RFID Readers, CCTV Cameras.
9. The bidder should ensure proper Integration with GIPCL Network and ensure Seamless integration with existing Campus Wide Network.
10. The bidder should ensure accessibility for all GIPCL applications.
11. The bidder should ensure Provision of scalability and any future network expansion, the bidder should make provision of new IT Hardware during project execution to provide end to end solution.
12. The bidder should properly do Installation of PTZ Camera with Pole and Structure Networking at proposed feeder breaker area. (Relocated camera)
13. The bidder should properly do Installation of Fix CCTV Bullet Camera with Structure Networking at conveyer gallery and Head End Junction Tower. (Relocated camera)



Package B Establish wired (OFC) and wireless network connectivity at below Locations

1. New Weigh Bridges (total 7 Nos.)
2. New Stock Areas Porta cabin (total 3 Nos.)
3. New Weigh Bridge Entry/Exit Road
4. Wireless Network Tower with Wireless Connectivity Link to GIPCL Network.
(near Weigh Bridge)

Package B Scope Includes

1. The bidder should lay OFC cables through HDPE conduit including trenching.
2. The bidder should lay STP cables through HDPE conduit including trenching.
3. The bidder should properly do all OFC splicing and termination of OFC cable inside LIU inside the Rack. After termination the OTDR testing report should be taken.
4. The bidder should properly do all Installation of Network Rack, LIU, Switches, I/O with Face plate, Enclosure box, etc end to end structural networking at all locations.
5. The bidder shall install, integrate, test and commission PTZ Camera with Pole and Structure Networking at Weigh Bridge Front and Weigh Bridge Back View.
6. The bidder should establishment of Wireless Network Connectivity (Redundancy Link) To ensure uninterrupted operations, wireless connectivity shall be provided as standby/backup link.
7. The bidder shall configure automated, dynamic failover routing between the primary wired OFC base Network and the standby wireless backup link. The failover switchover execution time must be seamless and must occur within 5 seconds of primary OFC base network failure.
8. The bidder should Supply, installation and commissioning of 80-feet GI self-supported wireless Network Tower.
9. The bidder should do Installation of long-range wireless devices (minimum 450 Mbps throughput).
10. The bidder should ensure Alignment, signal optimization and integration with network
11. The bidder should provide LAN & Structured Cabling Infrastructure by establishment of STP Cat6 structured cabling network
12. The bidder should ensure Connectivity to all field endpoints RFID Readers, CCTV Cameras, Controllers, PA System, Desktop PCs & Printers.
13. The bidder should ensure proper Integration with GIPCL Network and ensure Seamless integration with existing Campus Wide Network.
14. The wireless link performance testing must demonstrate a sustained minimum throughput of 450 Mbps with zero packet loss over a continuous 2-hour stress test. Application accessibility testing is defined as verifying end-to-end latency to GIPCL host servers of less than 10ms with 100% transaction success rates.
15. The bidder should ensure accessibility for all GIPCL applications.



16. The bidder should ensure Provision of scalability and any future network expansion, the bidder should make provision of new IT Hardware during project execution to provide end to end solution.



Package C Removal of one PTZ Camera with Pole from Vastan Feeder and Re-Installation at new surface feeder near Conveyor belt

Package C Scope Includes

1. The bidder shall safely dismantle the PTZ Camera with Pole and its associated accessories from Vastan Feeder and transport the equipment to the new location with utmost care to avoid any physical damage.
2. The bidder should do Installation of PTZ Camera with Pole and Structure Networking at mentioned location from nearby Porta cabin.
3. The bidder should lay STP cables through HDPE conduit including trenching.
4. The bidder should do termination and testing.
5. The bidder should do all Installation of Network Rack, Switches, I/O with Face plate, Enclosure box, etc end to end structural networking at mentioned locations.



Package D: Dismantling & Relocation of Existing IT Infrastructure

Package D Locations for Dismantling

1. Vastan Site Office
2. Vastan Feeder Breaker
3. Existing Weighbridges (WB3–WB7, WB13)
4. Conveyor Belt / VTC
5. Stock Areas and Porta Cabins
6. Other areas

Package D Scope of Dismantling

Bidder shall safely remove and handle the IT Equipment like Network Rack, Network Switch, LIU, Cables, PCs, Printers, UPS, CCTV Cameras, Wireless Devices, Wireless Towers, Poles, cables etc IT Infrastructure from above mentioned Locations for Dismantling. (for more Details kindly refer Annexure - Existing Location wise Details)

1. Prior to dismantling, the bidder shall prepare a joint Serialized Asset Inventory Register with GIPCL IT. Every item must be tagged with a unique ID label. A formal sign-off sheet must accompany the assets from the source site, through transit, to the destination site to maintain an unbroken chain of custody.
2. Before disconnecting any active device, the bidder shall take full configuration backups of all network switches and routers, and securely back up critical user data from local PCs. These backups must be verified and handed over to GIPCL IT digitally before the equipment leaves the source location.
3. The bidder shall ensure proper tagging and labelling of all assets, cables and network infrastructure in accordance with Annexure-F.
4. The bidder shall obtain comprehensive 'All Risk' transit insurance covering the full replacement value of all IT infrastructure assets during decommissioning, transit, and re-installation. The bidder shall be financially liable for the immediate, like-for-like replacement of any hardware damaged, lost, or degraded during the relocation process.
5. The bidder should do Safe dismantling without damaging any IT Infrastructure.
6. The bidder should provide Transportation to new locations or IT store as required.

Package D support for Re-Installation of IT Infrastructure at New Locations

After network readiness of Package A & B sites with end to end network connectivity, bidder shall Shift and do Re-installation of Network Rack, Network Switch, LIU, Cables, PCs, Printers, UPS, CCTV Cameras, Wireless Devices, Wireless Towers, RFID readers, Porta Cabins, CCTV camera (Fix & PTZ), traffic signal lights, positioning sensor and PA system pole, cables and other etc IT Infrastructure at new Weigh Bridges, New Mines Stock Areas, New Apron, Mangrol Stock Entry Exit Points, etc new locations as required.



1. The bidder should do Reinstallation of Network Rack, Network Switch, LIU, Cables, PCs, Printers, UPS, CCTV Cameras, Wireless Devices, Wireless Towers, RFID readers, Porta Cabins, CCTV camera (Fix & PTZ), traffic signal lights, positioning sensor and PA system pole, cables and other etc IT Infrastructure at new Weigh Bridges, New Mines Stock Areas, New Apron, Mangrol Stock Entry Exit Points, etc new & Existing locations as required.
2. The bidder should do all Installation of Network Rack, LIU, Switches, I/O with Face plate, Enclosure box, etc end to end structural networking at all locations.
3. The bidder should do Installation of PTZ Camera with Pole and Structure Networking at Weigh Bridge Front and Weigh Bridge Back View.
4. The bidder should do Installation of Fix CCTV Bullet Camera with Structure Networking at Conveyor gallery and Head End Junction Tower.
5. The bidder should establishment of Wireless Network Connectivity (Redundancy Link) To ensure uninterrupted operations, wireless connectivity shall be provided as standby/backup link.
6. The bidder should ensure Alignment, signal optimization and integration with network
7. The bidder should ensure Connectivity to all field endpoints RFID Readers, CCTV Cameras, Controllers, PA System, Desktop PCs & Printers.
8. The bidder should ensure proper Integration with GIPCL Network and ensure Seamless integration with existing Campus Wide Network.
9. The bidder should ensure accessibility for all GIPCL applications.
10. The bidder should ensure Provision of scalability and any future network expansion, the bidder should make provision of new IT Hardware during project execution to provide end to end solution.



Annexure-F: As-Built Documentation & Handover Requirements

The bidder shall submit the following documents in both hard copy and editable soft copy format:

Network Documentation

- Approved Logical Network Diagram
- Approved Physical Network Diagram
- OFC Route Layout Drawing
- OFC Core Allocation Sheet
- Wireless Network Topology Diagram
- IP Addressing Allocation Plan
- Network Device Inventory

Cabling Documentation

- OFC Termination Schedule
- OFC Splicing Details
- Port Mapping Schedule
- STP Cable Schedule
- Patch Cord Mapping Schedule

Asset Documentation

- Serialized Asset Register
- Asset Tag Register
- Asset Transfer Register
- Equipment Warranty Register

Configuration Documentation

- Network Switch Configuration Backup
- Wireless Device Configuration Backup
- Network Management Credentials (sealed format)



Annexure-G: Testing, Verification & Acceptance Format

The bidder shall submit the following records before project acceptance:

OFC Testing

- OTDR Reports
- Fiber Loss Measurement Report
- Fiber Core Continuity Report

Structured Cabling Testing

- STP LAN Certification Report

Wireless Connectivity Testing

- Signal Strength Report
- Throughput Test Report
- Packet Loss Test Report
- Link Availability Test Report

Failover Testing

- Primary OFC Failover Testing
- Wireless Failover Testing

Application Testing

- GIPCL Application Accessibility Verification
- RFID Application Testing
- CCTV Accessibility Testing
- CGMATR Accessibility Testing
- Network Printer Testing
- End User Acceptance Test Report



Annexure-H: Warranty Support & Escalation Matrix

The bidder shall submit the following before final project closure:

Warranty Information

- Equipment-wise Warranty Register
- OEM Support Contact Details
- Warranty Claim Procedure

Support Matrix

Level	Contact	Responsibility
L1	Resident Engineer	Site Support
L2	Project Manager	Escalation
L3	OEM Support Team	Product Level Support

Escalation Information

- Contact Number
- Email Address
- Escalation Time Matrix
- OEM Service Desk Details

Warranty Records

- Device Serial Number
- Installation Date
- Warranty Expiry Date
- OEM Support Reference



Bidders shall refer the following annexure for details.

SR NO.	Annexure
1.	Existing Location wise Details
2.	New Items ToBe req. Approx Qty
3.	Tentative Make
4.	Network Switch
5.	Network Rack
6.	Optical Fiber Cable
7.	LIU
8.	OFC Patch Cord
9.	HDPE
10.	CAT6 STP Cable
11.	Wireless Tower
12.	Wireless Device

ANNEXURE:1 Existing Location wise Details of IT Infrastructure

Existing Location wise Details of IT Infrastructure												
Asset Serial Nos	Location	LIU	SFP & OFC Patchcord Used	Network Rack	UPS	Reader With Pole & Other Stuff	Controller / Traffic light Set With Pole	Fixed cctv With Pole	PTZ CT V With Pole	Porta Cabin	Wireless Tower	Computer Set With Printer
1.	WB 3&4	2	8	1	2	4	4	2	0	0	1 Self Support	2
2.	WB 13	1	4	1	1	2	2	1	0	0	0	1
3.	Vastan South Stock yard New	1	4	1	0	2	0	1	0	1	0	0
4.	WB 5&7	2	8	1	2	4	4	2	0	0	0	2
5.	WB 6	1	4	1	1	2	2	2	0	0	1 Self Support	1
6.	New Porta Cabin for CCTV opp WB5/6/7	1	2	1	0	0	0	0	1	1	0	0
7.	Vastan Stock Yard	1	2	1	0	2	0	0	0	1	0	0
8.	Vastan Feeder Breaker	1	4	1	0	4	0	0	1	1	0	0
9.	Vastan Stock yard New	1	2	1	0	2	0	1	0	1	0	0
10	Vastan South Stock yard	0	0	0	0	2	0	1	0	0	0	0
11	Mangrol Stockyar	0	0	0	0	2	0	0	1	0	0	0



	d Entry/Exit											
12	JNT-13 To Vastan Feeder Breaker LHS CCTV Camera	0	0	0	0	0	0	2	1	0	0	0
	Total Quantity	1 3	44	11	6	27	12	16	4	5	3	6

Points to be noted:

The specifications and quantities provided herein are purely indicative and subject to alteration. The final requirements shall be determined and frozen upon the successful completion of the ongoing tendering process and the finalization of the contract for the GILDMS RFID system upgrade and revamp Project.

A wired or wireless network must be established at the existing locations—including the Vastan Site Office, VTC, 25 MW Solar plant office, etc. —prior to the execution of Package D.

Civil Works — RCC base Foundation as per industrial standard required for RFID readers, Pota Cabins, CCTV camera (Fix & PTZ), traffic signal lights, positioning sensor and PA system pole and other civil related work to be required.

Electrical Works — as per industrial standards required. Power cabling, distribution boards, earthing, power extension to all IT Infrastructure Location.



ANNEXURE:2 New Items To be Required with Approx. Quantity

New Items Tobe Required with Approx. Quantity				
Sr. No	Description	UOM	Appro x Qty	Remarks
1	UHF RFID Reader with related all Accessories, including all type of cables & mounting accessories— Long Range ($\geq 12\text{m}$), Industrial Grade, IP65, ISM 865–868 MHz, EPC Gen2, with 2 antennae (with support of minimum 4 antenna)	No.	6	Considering 4 Existing Weight Bridges Info shifted and 3 new additional Weight bridge Infrastructure to be required For Make and Models : should be same as installed at existing Weight Bridges.
2	IP CCTV Bullet Camera – 5 MP with IR Illuminator, complete with all required accessories, including cables, mounting hardware, and associated mounting accessories.	No.	3	Considering 3 camera for three nos. of new WB requirement. For Make and Models : should be same as installed at existing Weight Bridges.
3	IP CCTV ANPR Bullet Camera — 5MP, Motorized Varifocal, IR 50m, IP66, LPR Accuracy >98%, H.265; with all accessories incl. pole & mounting accessories.	No.	3	Considering 3 camera for three nos. of new WB. For Make and Models : should be same as installed at existing Weight Bridges.
4	IR Based Vehicle Positioning Sensor Set — 3 Pairs per weighbridge, MS/GI Square Tube Pole (72×72mm, 2mm thick), 3-axis adjustable clamp, auto-detect faulty sensor; complete set	No.	9	For Make and Models : should be same as installed at existing Weight Bridges.



	with all accessories incl. pole & mounting accessories			
5	PA System with LED Display — 30W RMS Amplifier, IP-rated Speaker, LED Display 36"×12" Red, Gujarati/Hindi Voice Configurable, Event-Triggered, IP56; with all accessories	No.	3	For Make and Models : should be same as installed at existing Weight Bridges.
6	24 Port managed Network switch POE gigabit switch, 2 combo copper uplink+ 2 SFP module with PoE +support (SFP included) with 6U weather proof Cabinet enclosure/Rack	No.	12	For Make and Models : should be same as installed at existing Weight Bridges.
7	IoT Based Controller — for weighbridge integration (Ability to integrate with boom barrier, sensors, PA, traffic lights, RFID interface) with related all Accessories & cables	No.	3	For Make and Models : should be same as installed at existing Weight Bridges.
8	Signal Light (Set of Red & Green) with related all Accessories & cables	No.	6	For Make and Models : should be same as installed at existing Weight Bridges.
9	1 KVA UPS — 1 Hr Battery Backup,	No.	3	For Make and Models : should be same as installed at existing Weight Bridges.
10	Desktop PC for Weighbridges — Windows 11, 16GB RAM, 1TB HDD, Onboard RS-232 (COM1), Speaker; with 19" LED Monitor, Keyboard, Mouse etc.	No.	3	For Make and Models : should be same as installed at existing Weight Bridges.
11	80-foot 4-legged Galvanized Iron (GI)	Lot	1	Standard



	Self-Supporting Wireless Tower			
12	Wireless Devices - P2P High Power Device with all Accessories	No.	10	Approved Make Mimosa and cambium. with support upto 5KM distance and 200mbps minimum bandwidth
13	Fully Loaded 12 Port LIU	No.	12	Approved Make Molex, digisol, D-Link
14	HDPE Industrial grade conduit Pipe	Meters	9000	Standard with ISI Marked
15	12-Core Single-Mode Armored Industrial Fiber Cable	Meters	3000	Approved Make Molex, digisol, D-Link
16	I/O with Dual faceplate and back box set	Set	500	Approved Make Molex, digisol, D-Link
17	Industrial grade RJ45	No.	1000	Approved Make Molex, digisol, D-Link
18	CAT6 STP Cable Durm (305 Meters box)	Box	20	Approved Make Molex, digisol, D-Link
19	Miscellaneous Items — Poles, Fabricated Structures, Junction Boxes, Mounting Hardware, I/O Faceplates, RJ45, Cables, Conduits, Fasteners, miscellaneous accessories/components etc.	Lot	1	For Make and Models : should be same as installed at existing Weight Bridges.



ANNEXURE:3 Technical Details for Tentative OEM/Make

Technical Details for Tentative OEM/Make			
SR N	Item Description	Approved Make / OEM	Remarks
1	24 Port managed Network switch POE gigabit switch,2 combo copper uplink+ 2 SFP module with PoE+ support (SFP included) with 6U Cabinet enclosure/Rack	Cisco / Zyxel/Dlink	
2	12-Core Single-Mode Armored Industrial Fiber Cable	Molex, digisol, D-Link	
3	Fully Loaded 12 Port LIU	Molex, digisol, D-Link	
4	OFC Patch Cord - SC - LC Duplex Patch Cord	Molex, digisol, D-Link	
5	HDPE Industrial grade conduit Pipe	Standard	
6	CAT6 STP Cable Durm (305 Meters box)	Molex, digisol, D-Link	
7	Wireless Tower - 80 Feet GI Self Supported Wireless Tower	Standard	
8	Wireless Devices - P2P High Power Device with all Accessories	Mimosa, Cambium	
9	Industrial grade RJ45	Molex, digisol, D-Link	
10	I/O with Dual faceplate and back box set	Molex, digisol, D-Link	
11	Miscellaneous Items — Poles, Fabricated Structures, Junction Boxes, Mounting Hardware, I/O Faceplates, RJ45, Cables, Conduits, Fasteners, miscellaneous other accessories/components as per project requirements.	Standard (Industrial Grade)	

ANNEXURE:4 Network Switch

Technical Specification of Network Switch with related all Accessories			
Sr. No	Feature Requirement	Compliance Yes/ No	Remarks
	Architecture & Performance		
1	Switch should have total 24 Nos. Gigabit port of 10/100/1000 Mbps PoE Ethernet Ports and 2 Nos. Gigabit SFP slot(SFP/GbE).		
2	The Switch should have Non-blocking wire speed switch fabric, should have Min. 20 Gbps Back plane or more and should have Min.14.8 Mbps or more		
3	Should support IEEE 802.3az standard for minimize the power consumption on per port basis by supplying power on the basis of cable length and active ports only		
4	Should support Dual Software (firmware) image		
	Should support the following Standard		
5	IEEE 802.3 10BASE-T Ethernet, IEEE 802.3u 100BASE-TX Ethernet, IEEE 802.3ab 1000BASE-T Ethernet, IEEE 802.3z 1000BASE-X Ethernet, IEEE 802.3x flow control IEEE 802.3af PoE and IEEE 802.3at PoE plus		
6	IEEE 802.1D spanning tree protocol IEEE 802.1w rapid spanning tree protocol, IEEE 802.1s multiple spanning tree protocol		
7	IEEE 802.1p class of service, priority protocols, IEEE 802.1X port authentication, IEEE 802.3ad LACP aggregation		
	Traffic Management and QoS		
8	Rate limiting: port-based bandwidth control, 64 kbps granularity		
9	Port-based egress traffic shaping		
10	Switch should support Jumbo frames of 9KB		
11	should support broadcast storm control to avoid unwanted traffic attack on CPU		
12	should support IEEE 802.1p with priority queues for different traffic types		
13	Switch should be able to automatically detect the power consumption status of each Powered Device and supply only the amount of power required to minimize the waste and unused power		



14	Supports IGMP/IGMP snooping v1, v2, v3		
	Link Aggregation		
15	IEEE 802.3ad LACP link aggregation compliant		
16	Up to 8 aggregation groups,		
	Resilient Network		
17	Should support IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)		
18	Should support IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)		
	User Security and Authentication		
19	should support MAC filtering per port secures access to each port		
20	should support IEEE 802.1Q tag-based and port-based VLAN		
21	Switch should support Guest VLAN and VOICE VLAN		
22	Should support IEEE 802.1x based on guest VLAN		
23	should support at least 1K static VLAN.		
24	should support Port-base VLAN		
25	should support limited MAC number per port		
26	Should be capable to set mac ageing time		
27	should support Loop guard to avoid loops in network generated on unmanaged switches		
28	should support 802.1X port-based authentication, compensated assignment over VLAN.		
29	Should support 802.1ab LLDP and MED		
30	Should support SNTP, Syslog.		
	Network Administration Security		
31	should support SSL		
32	Should support static and dynamic IP-MAC and Port binding for port security		
33	The switch should have scheduling for POE.		
	IPv6 Support		
34	IPv6 over Ethernet, IPv6 Addressing, ICMPv6, DualStack, Neighbor discovery		
	Network Management		
35	Web-based management, SNMP v1, v2c, v3		
36	RMON four RMON groups 1, 2, 3, 9 (history, statistics, alarms and events) for enhanced traffic management, monitoring and analysis		
37	Port mirroring: supports source/destination/both port mirroring		



38	Switch should be supplied with management software to manage and maintain multiple layer2 switches for Centralized and batch configurations like IP configurations, IP renew, Web GUI access, Firmware update, device locating etc.		
39	The switch should have minimum MTBF of 801,100.		
40	The PoE power budget of the device should be more than 75 Watts.		
41	The switch protects against scan attack and Ping of death		
	Certification		
42	CE, FCC, C-Tick, Class B		
43	The OEM Brand should be having valid ISO 9000, ISO 14000 certificates, all these certificates must be submitted in technical bid.		
44	All switches and modules must be from the same OEM for better compatibility		
	Environmental specifications		
45	Operating temperature 0 Deg C to 50 Deg C		
46	Operating Humidity 10% to 95 % (Non condensing)		



ANNEXURE:5 Network Rack

<u>Technical Specification of IP56 Series 6U Outdoor Rack with related all Accessories</u>			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Structure : Welded Structure,With Outdoor Silicon Sealant, EPDM IP Gasket,Locking Provison.		
2	Cable Entry : Bottom Side With Cable Entry Provison		
3	Front Door: Lockable		
4	19" Mounting Angle :Formed Steel		
5	Standard Finish : Power Coated		
6	Pole Mount		
7	Rack Size : 6U		
8	IP Rating : IP56		
9	Accessories : power distribution 19" 6 Socket of 5amp, Cable Manager, Mouting Hardware, FAN 230VAC, Shelf		

ANNEXURE:6 Optical Fiber Cable

Technical Specification of 12-Core Single-Mode Armored Industrial Fiber Cable			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Approved Brand Dlink, digilink, molex		
2	Fiber Type - OS2 Single-mode (ITU-T G.652.D or G.657.A1)		
3	Core / Cladding Diameter - 9 / 125 μ m		
4	Max Attenuation (1310 nm) - $\leq$ 0.35 dB/km		
5	Max Attenuation (1550 nm) - $\leq$ 0.25 dB/km		
6	Fiber Count - 12 Cores		
7	Aarmor Material - Corrugated Steel Tape (CST) or Aluminum Interlock		
8	Outer Jacket Material - HDPE (Outdoor) or LSZH (Indoor/Outdoor Industrial)		
9	Core Identification - TIA/EIA-598 standard color coding (1 to 12)		
10	Moisture Protection - Water-blocking gel-filled loose tube or dry swellable tape		
11	Crush Resistance - $\geq$ 2000 N / 100 mm		
12	Tensile Strength (Short-Term) - $\geq$ 1500 N		
13	Tensile Strength (Long-Term) - $\geq$ 600 N		
14	Bending Radius (Dynamic) - 20 x Cable Outer Diameter		
15	Bending Radius (Static) - 10 x Cable Outer Diameter		
16	Operating Temperature - -40°C to +70°C		
17	Storage Temperature - -40°C to +75°C		
18	Compliance / Safety - RoHS, UV Resistant, Rodent Resistant		



ANNEXURE:7 LIU

<u>Technical Specification of LIU with related all Accessories</u>			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Approved Brand Dlink, digilink, molex		
2	Nos. of ports - 12 Port Fully Loaded with Adapter		
3	Size - 1U rack mountable cabinet		
4	housing material : Aluminium housing with durable epoxy powder coating		
5	OFC Cable entry point - minimum two OFC cable entries point at backside		
6	Sliding lid for easy maintenance		
7	cable manager		



ANNEXURE:8 OFC Patch Cord

<u>Technical Specification of SC - LC Duplex Patch Cord</u>			
Sr.No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Approved Brand Dlink, digilink, molex		
2	singlemode fiber optic patch cable		
3	Connector type SC-LC		
4	cable type PVC 0.9mm duplex		
5	cable length 3 meter		
6	Fiber Count : duplex (2-fiber)		



ANNEXURE:9 HDPE

<u>Technical Specification of HDPE Pipe with related all Accessories</u>			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Product Type : PLB (Permanently Lubricated)-HDPE		
2	Outside Diameter : 40.0 mm (Tolerance +0.4 mm-0.0 mm)		
3	Wall thickness : 3.50 mm (Tolerance +0.20 mm)		
4	Standard : Industrial standard, ISI Marked		
5	Color : Black with Blue Strip		
6	Material Grade: PE80 or above		



Technical Specification of CAT6 STP Cable Durm (305 Meters box)			
Sr .No .	Feature Requirement	Compliance Yes/ No	Remarks
1	Approved Brand : Dlink, digilink, molex		
2	Cable Type : The 4 Pair Shielded Twisted Pair cable shall be shielded twisted pair cable.		
3	Nominal Outer Diameter of cable should be at least 6.1 +/-0.1 mm and Conductor Diameter 0.56 mm (23 AWG)		
4	Construction: 4 twisted pairs separated by internal PE cross separator. Full separator. Pairs are wrapped in polyester tape and aluminium foil and Tinned Copper Braiding .Outer layer with PVC Jacket Rip Cord is must Conductor Solid bare Copper and outer jacket sheath FRPVC/LSZH and UL approved CM rated cable.		
5	Insulation : High Density Polyethylene Solid		
6	Dielectric Strength of cable should be 1000 V RMS		
7	Cable should support operating temperature from 20 C to 70 C		
8	Printed sequential Length Conter of each meter on outer Jacket		
9	Category 6 STP cable should support Gigabit Ethernet(1000 base-T) Standard and Operated at bandwidth of 250MHz		



ANNEXURE:10 CAT6 STP Cable

<u>Technical Specification of CAT6 STP Cable Durm (305 Meters box)</u>			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Approved Brand : Dlink, digilink, molex		
2	Cable Type : The 4 Pair Shielded Twisted Pair cable shall be shielded twisted pair cable.		
3	Nominal Outer Diameter of cable should be at least 6.1 +/-0.1 mm and Conductor Diameter 0.56 mm (23 AWG)		
4	Construction: 4 twisted pairs separated by internal PE cross separator. Full separator. Pairs are wrapped in polyester tape and aluminium foil and Tinned Copper Braiding .Outer layer with PVC Jacket Rip Cord is must Conductor Solid bare Copper and outer jacket sheath FRPVC/LSZH and UL approved CM rated cable.		
5	Insulation : High Density Polyethylene Solid		
6	Dielectric Strength of cable should be 1000 V RMS		
7	Cable should support operating temperature from 20 C to 70 C		
8	Printed sequential Length Conter of each meter on outer Jacket		
9	Category 6 STP cable should support Gigabit Ethernet(1000 base-T) Standard and Operated at bandwidth of 250MHz		

ANNEXURE:11 Wireless Tower

Technical Specification of 80-foot 4-legged Galvanized Iron (GI) Self-Supporting Wireless Tower with related all Accessories			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Tower Height : 80 feet (24.38 meters) : General Design		
2	Structural Geometry : 4-Legged square lattice base, tapered profile with straight top section : IS 800:2007 / IS 802		
3	Design Base Width : 2.4 meters to 3.0 meters (optimized for overturning moment) : Structural Layout		
4	Design Top Width : 0.6 meters to 0.8 meters : Antenna Mounting Interface		
5	Total Estimated Structural Weight : 3.8 to 4.8 Metric Tons (includes 4–6% zinc weight gain) : Fabrication Estimate		
6	Basic Wind Speed (V_b) : 47 m/s (approx. 170 km/h) — Wind Zone 4 : IS 875 (Part 3): 2015		
7	Seismic Zone Compatibility : Configured for Zone II, III, IV, and V parameters : IS 1893 (Part 1): 2016		
8	Main Leg Material : Structural High-Tensile Steel, Grade E350 (BR/BO) : IS 2062:2011		
9	Bracing & Girders Material : Structural Mild Steel, Grade E250A, configured in X/K pattern : IS 2062:2011		
10	Corrosion Protection : Post-fabrication Hot-Dip Galvanization (HDG) : IS 2629		
11	Zinc Coating Mass : Minimum 610 g/m ² (~85 to 100 microns layer thickness) : IS 4759		
12	Hardware & Fasteners : High-strength structural bolts & nuts (Grade 8.8), Hot-Dip Galvanized : IS 1367 / IS 4000		



13	Max Torsional Deflection : $\leq \pm 0.5^\circ$ twist/sway at peak 47 m/s wind force : Antenna Alignment Criteria		
14	Climbing Assembly : Vertical GI step-ladder with a permanent fallback safety cage : Safety Standard		
15	Cable Management : Full-height vertical GI runway cable tray for RF/Fiber routing : Feeder Routing		
16	Lightning Protection : 1-meter multi-point spike air terminal connected via GI strip : IS/IEC 62305		
17	Earthing System : 4-point chemical or pipe earthing pit network; resistance < 5 Ohms : IS 3043		
18	Civil Foundation Design : Ground-Based Tower (GBT) concrete pad-and-pier / raft : IS 456 / IS 4091		
19	Anchor Foundation Bolts : High-tensile heavy-duty anchor J-bolts with template assembly : IS 5624		



ANNEXURE:12 Wireless Device

<u>Technical Specification of Wireless Device with related all Accessories</u>			
Sr. No.	Feature Requirement	Compliance Yes/ No	Remarks
1	Operational Spectrum : Continuous tuning across unlicensed 5 GHz band (5150 – 5875 MHz); support for extended frequencies down to 4910 MHz or up to 6425 MHz is acceptable.		
2	Channel Bandwidths : Must adaptively support channel sizes of 20 MHz, 40 MHz, and 80 MHz. Support for 160 MHz channels is required for ultra-high-capacity targets.		
3	Air Interface Protocol : High-efficiency Time Division Multiple Access (TDMA) or Synchronized Spectrum Reuse scheduling mechanism.		
4	Legacy Compatibility : Native software backward-compatibility mode to authenticate and communicate with older 802.11n / 802.11ac base stations.		
5	Max TX Output Power : Internal RF front-end must maintain a high-power output capability of up to 27 dBm.		
6	Modulation Profiles : Dynamic scaling from a baseline of 256-QAM up to a maximum platform ceiling of 1024-QAM (OFDMA / MU-MIMO).		
7	Antenna Configuration : Must fulfill one of two variations: • Option A: Integrated high-gain parabolic reflector dish yielding 25 dBi gain. • Option B: Native low-profile assembly (8 dBi) with modular mechanical twist-on / connectorized interface for external dishes up to 30 dBi.		
8	Data Capacity Ceiling : Sustained aggregate Layer-2 IP data payload capacity of at least 500 Mbps, with a		



	platform hardware ceiling up to 2.0 Gbps.		
9	Physical Interface : Minimum of 1x 10/100/1000 Base-T auto-sensing Gigabit Ethernet (RJ-45) port.		
10	Wired Surge Protection : Integrated internal Electrostatic Discharge (ESD) surge suppression circuitry.		
11	Power Method : Single-cable installation via Passive Power over Ethernet (PoE).		
12	Input Voltage Range : Operational input acceptance window between 24 V DC and 30 V DC (supports up to 56 V DC via proprietary injectors).		
13	Max Power Draw : Maximum system power consumption must not exceed 20 W under full traffic and transmission load.		
14	Ingress Protection : Minimum environmental weather certification of IP55 for rain/dust. IP67 die-cast aluminum is preferred for harsh environments.		
15	Operating Temperature : Continuous outdoor operation baseline matching from -40°C to +55°C (-40°F to 131°F).		
16	Wind Resistance : Complete structural survival capability in wind velocities up to 200 km/h (124 mph).		