Bid Corrigendum

GEM/2025/B/6134202-C4

Following terms and conditions supersede all existing “Buyer added Bid Specific Terms and conditions” given in the
are advised to bid as per following Terms and Conditions:

Buyer Added Bid Specific Additional Terms and Conditions

1. OPTION CLAUSE: The Purchaser reserves the right to increase or decrease the quantity to be ordered up to 25
The purchaser also reserves the right to increase the ordered quantity up to 25% of the contracted quantity c
delivery period of quantity shall commence from the last date of original delivery order and in cases where op
additional time shall commence from the last date of extended delivery period. The additional delivery time s
delivery period (in days), subject to minimum of 30 days. If the original delivery period is less than 30 days, th
Purchaser may extend this calculated delivery duration up to the original delivery period while exercising the
2. Buyer Added text based ATC clauses

1. **1. Eligibility Criteria**: Bidder should meet the following eligibility criteria:

    1.1. **Legal Valid Entity**: Bidder should be legal Valid Entity in form of Propritorship/LLP/Partnership/P
    porting documents including GST, PAN etc to be submitted in Technical Bid.

    1.2. **Minimum Turnover /Financial Capability**: Bidder should have Minimum avarage annual audit
    22-23,2023-24) supporting documents including Audited Balance sheet/CA Certificate with UDIN
    o submit Audited/Unaudited turnover for FY 2024-25.

    1.3. **Minimum Experience/Technical Capability**: Bidder should have completed at least 3 similar w
    h 2025).

    Similar works*: SITC of IT infrastructure/Networking setup Including Laying of Fiber Ca

    Supporting documents either in form of copy of completion certificate with work order/Purchase c
    ights to call TDS Certificate /26AS from any or all bidders to check the genuineness of the certifica

    1.4. **Local Presence**: Bidder should have office in Indore/Dhar, copy of supporting documents in forr
    chnical bid.

    1.5. **OEM Authorization:** Bidder should have OEM or Authorized Partner /Service provider/of OEM, copy
    d.

    1.6. **Acceptance of Terms and conditions**: Bidder should have to submit sealed and signed copy
    ms and conditions. Bidder may also submit a certificate on its letter head undertakes acceptance
    submitted in technical bid.

    1.7. Technical Specification Compilation : Bidder need to fill all the compliance as main
    ent. Same should be submitted in technical bid.

    2. **Other terms and conditions**:

    2.1. **Payment**: 80% of the invoice value shall be release on completion of work after due certificatio
    e of completion of work. Balance 10% shall be release on after successful completion of warranty

    2.2. **Warranty period**: 3 years from the date of completion of work OR as per OEM warranty which e

    2.3. **Performance Security**: 5% of the contract amount in favour of ‘National Automotive Test Trac
    schedule bank. The performance security should be valid for at least 38 months from the date of

2.4. **Work completion period**: **4 months** from the date of issuance of work order, failing which NA
mum 10% of the contract amount for the delay attributable to the contractor.

3. Accepted makes: item-wise accepted makes are:

S. No	Item Details	Accepted Makes
1	L3 Managed Switch	D-link/ Digisol/ HP/Cisco
2	L2 Managed Switch	D-link/ Digisol/ HP/Cisco
3	Module Single Mode & Dual port	D-link/ Digisol/ HP/Cisco
4	RACK: 550 W x 600 D - Grey Colour Front Glass Door (tinted, Toughened) with Lock & Key, 2 pairs of 19" Mounting Rails with U-Marking Welded Side Walls**.** Standard Accessories: 1U Cable Manager (1), Hardware Packet (1 Pkt) 6 Socket 5 Amp. Power Distribution Unit (1 No) Roof Mounted Fan Unit / 90 CFM /230V AC (1 No)	D-link/ Netrack/ Schneider electric
5	Patch Panel Cat 6 UTP Keystone Type 24 Port Fully Loaded	D-link/ Digisol/ HP/Cisco
6	LIU Rack Mount Loaded LC SM + PIGTAIL LC SM625um OM1 SIMPLEX LENGTH 1m	D-link/ Digisol/ HP/Cisco
7	Cable Manager with Cover	No.
8	Fiber patch cord Single mode duplex LC style & Dual Port	D-link/ Digisol/ HP/Cisco
9	Fiber Junction Box	D-link/ Digisol/ HP/Cisco
10	Cat6 Patch Cord (10G)	D-link/ Digisol/ HP/Cisco
11	RJ 45 Connector	D-link/ Digisol/ HP/Cisco
12	OFC Cable 12F Armoured Fiber Optic Cable 12 Core Single Mode Shielded	D-link/ Digisol/ HP/Cisco
13	Cable Tie 8 mm	Any ISI Marks

14	Tag Tie	Any ISI Marks
15	HDPE 1"	Any ISI Marks
16	Flexible Pipe	Any ISI Marks

Note: NATRAX/Buyer shall not accept any other make or model other than me

details are as enclosed herewith in attached file

for any details/query please contact at 8376093255 or write at anuj.kumar@natrip.in

the replies of pre- bid queries are as below and enclosed herewith in attached document:

Sr. No.	Page No.	Clause (in brief) of Tender Document requiring clarification(s)	Queries and Justification by Buyer
1	**Specification >General Features >Page 07 under s.no 1.2 and 1.3.**	6.1. 24 port Gigabit stackable switch with additional 6 SFP+ ports (Layer 3):	We would request to change port nfiguration from 6 x 10G SFP+ to 10G SFP+, 4 port uplink is sufficient for network, switch requ d maximum 2 ISP link which is terminate on 1 SFP+ and rest 2 10G port for Stacking.
	Specification >Performance and Scalability >Page 08 under s.no 2.1 and 2.2.	6.1. 24 port Gigabit stackable switch under Switching bandwidth and Packet Forwarding Rate.	we would request to remove or give option for high swhing bandwidth 176GB and packet forwarding 13 PPS, because as per asking port c iguration switching fabric maximu 128GB and forwarding rate 95.23Mpps.
	Specification >Performance and Scalability >Page 08 under s.no 2.5.	6.1. 24 port Gigabit stackable switch under active IP Interfaces.	We would request to change or give option for Ip Interfaces 256 instead of 1K, 256 active IP interface is suffi nt for Network.

	Specification >Performance and Scalability >Page 10 under s.no 11.1.	6.1. 24 port Gigabit stackable switch under Jumbo frame , MTU, Mac Address Table.	We would request to change or give option for jumbo frame 12K instead of 14K, and MTU is maximum 9K and asking 10K which is not possible and MAddress table is 68K instead of 90K and it is sufficient for Network.
	Specification >Manufacturing and Support >Page 08 under s.no 2.8, 2.9, 2.10.	6.1. 24 port Gigabit stackable switch under manufacturing unit.	we would request to remove or g option for manufacturing unit to vice center and The OEM should l e its Service center unit in India for the past 10 years, which is effective for BID and after sales rvice important uses for project.
	Specification >Stacking >Page 11 under s.no 3.5	6.2. PoE 24 port Gigabit switch 4 x 10G (Layer 2 Managed Switch	We would request to change or g option for stacking 12 group of sv hes instead of 16 groups of switc which is sufficient for stacking an will help full to all OEM. We would e to suggest kindly add 6 KV Surg rotection for switch/port safety
	Specification >Management >Page 15 under s.no 19.	6.3. PoE_8 port Gigabit switch 2 x 1G (Layer 2 Managed Switch) under Power	We would request to remove or g option for DC power supply, AC p r supply is most effective as com e to DC and DC supply required a tional power supply unit which is good for intallation point so kindl move DC supply option. We woul e to sugget kindly add ERPS for ri protection into 8 port switch also mentioned into 24 port and core ch, because complete chain requ ERPS support. We would like to su et kindly add 6 KV Surge protecti or switch/port safety.

2	**Corrigendum Pg No. 9 Scope of Work and technical specification**	Point No. b) Laying of Outdoor Optical Fiber cable should be through HDPE Pipe with atleast 1.5 mtr digging including all required materials as per the requirement of site with preparing the proper junction. All cabling must be “Structured”	As per the clause you have asked for 1.5 Mtr. Digging. Where the standard digging norm as per vt. is 0.9 Mtr. or 1 Mtr.
3	**Corrigendum Pg No. 2 Item wise acceptable makes are as below :**	Sr. No. 3 Module Single Mode & Dual Port	You have asked for 10G SFP Multimode & 1G SFP Multimode
4	**Corrigendum Pg No. 16 6.4 and 6.5**	Multimode & Dual Port 10G SFP+ Multimode & Dual Port 1G SFP	You have asked for 10G SFP Multde & 1G SFP Multimode
5	**Page No. 12, 9.8**	Switch supports ERPS G.8032, recovery time <50ms	You have asked in Layer 3 and La 2 Switch whereas it has not been ed in 8 Port switch

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3. Buyer uploaded ATC document Click here to view the file.

Disclaimer

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. If following, the bid and resultant contracts shall be treated as null and void and such bids may be cancelled by GeM a

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issu
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to exer
3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category i
4. Creating BoQ bid for single item.
5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
7. Floating / creation of work contracts as Custom Bids in Services.

8. Seeking sample with bid or approval of samples during bid evaluation process. (However, in bids for attached policy of the buyer nodal Ministries)
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifyir
10. Seeking experience from specific organization / department / institute only or from foreign / export experienc
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case m

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller with to all such representations and would not be allowed to open bids if he fails to reply to such representations.

*This document shall overwrite all previous versions of Bid Specific Additional Terms and Conditions.

This Bid is also governed by the General Terms and Conditions

Sr. No.	Page No.	Clause (in brief) of Tender Document requiring clarification(s)	Queries and Justification by Bidder	Suggestion by bidder	Response
1	**Specification >General Features >Page 07 under s.no 1.2 and 1.3.**	6.1. 24 port Gigabit stackable switch with additional 6 SFP+ ports (Layer 3):	We would request to change port configuration from 6 x 10G SFP+ to 4 x 10G SFP+, 4 port uplink is sufficient for network, switch required maximum 2 ISP link which is terminate on 10G SFP+ and rest 2 10G port for Stacking.		No change - 4 ports will populated and 2 spares for future expansions and scalability
	Specification >Performance and Scalability >Page 08 under s.no 2.1 and 2.2.	6.1. 24 port Gigabit stackable switch under Switching bandwidth and Packet Forwarding Rate.	we would request to remove or give option for high switching bandwidth 176GB and packet forwarding 131 MPPS, because as per asking port configuration switching fabric maximum 128GB and forwarding rate 95.23Mpps.		No Change - this is our minimum requirement, you can proposed equivalent or higher.
	Specification >Performance and Scalability >Page 08 under s.no 2.5.	6.1. 24 port Gigabit stackable switch under active IP Interfaces.	We would request to change or give option for Ip Interfaces 256 instead of 1K, 256 active IP interface is sufficient for Network.		No Change. Higher value is always a good option for future scalability / expandability
	Specification >Performance and Scalability >Page 10 under s.no 11.1.	6.1. 24 port Gigabit stackable switch under Jumbo frame , MTU, Mac Address Table.	We would request to change or give option for jumbo frame 12K instead of 14K, and MTU size is maximum 9K and asking 10K which is not possible and MAC address table is 68K instead of 90K and it is sufficient for Network.		No Change - This is our min. requirement, you can proposed equivalent or higher
	Specification >Manufacturing and Support >Page 08 under s.no 2.8, 2.9, 2.10.	6.1. 24 port Gigabit stackable switch under manufacturing unit.	we would request to remove or give option for manufacturing unit to Service center and The OEM should have its Service center unit in India for the past 10 years, which is effective for BID and after sales service important uses for project.		No Change - As per government norms under Make In India perspective, manufacturing unit should be in india.
	Specification >Stacking >Page 11 under s.no 3.5	6.2. PoE 24 port Gigabit switch 4 x 10G (Layer 2 Managed Switch	We would request to change or give option for stacking 12 group of switches instead of 16 groups of switches, which is sufficient for stacking and it will help full to all OEM. We would like to suggest kindly add 6 KV Surge protection for switch/port safety		Okay to change for stacking. No change in 6KV protection
	Specification >Management >Page 15 under s.no 19.	6.3. PoE_8 port Gigabit switch 2 x 1G (Layer 2 Managed Switch) under Power	We would request to remove or give option for DC power supply, AC power supply is most effective as compare to DC and DC supply required additional power supply unit which is not good for intallation point so kindly remove DC supply option. We would like to sugget kindly add ERPS for ring protection into 8 port switch also as mentioned into 24 port and core switch, because complete chain required ERPS support. We would like to sugget kindly add 6 KV Surge protection for switch/port safety.		Require DC power supply. Can accept ERPS point. No change in 6KV protection
2	**Corrigendum Pg No. 9 Scope of Work and technical specification**	Point No. b) Laying of Outdoor Optical Fiber cable should be through HDPE Pipe with atleast 1.5 mtr digging including all required materials as per the requirement of site with preparing the proper junction.	As per the clause you have asked for 1.5 Mtr. Digging. Whereas the standard digging norm as per Govt. is 0.9 Mtr. or 1 Mtr.	We suggest to revised digging from 1.5 Mtr. To 0.9 Mtr. Which will save your cost of organization and will help for faster finishing of project.	Accept - Digging Should be minimum 1mtr.
3	**Corrigendum Pg No. 2 Item wise acceptable makes are as below:**	Sr. No. 3 Module Single Mode & Dual Port	You have asked for 10G SFP Multimode & 1G SFP Multimode	Your Network of single mode OFC cable hence it is suggested to go for single mode 10G and 1G OFC module	Please read Multimode as Single Mode. All the fiber equipment should be Single mode.

4	**Corrigendum Pg No. 16 6.4 and 6.5**	Multimode & Dual Port 10G SFP+ Multimode & Dual Port 1G SFP	You have asked for 10G SFP Multimode & 1G SFP Multimode	Your Network of single mode OFC cable hence it is suggested to go for single mode 10G and 1G OFC module	Please read Multimode as Single Mode. All the fiber equipment should be Single mode.
5	**Page No. 12, 9.8**	Switch supports ERPS G.8032, recovery time <50ms	You have asked in Layer 3 and Layer 2 Switch whereas it has not been asked in 8 Port switch	The objective of ERPS will not be achieved if you do not have the switcher in your 8 Port switch for ring topology connectivity. It is suggested to include in 8Port switching.	All the managed Switches should be ERPS enabled, it is mandatory.

TERMS & CONDITIONS

Expansion of existing IT (Data/Voice) Network and associate work to all buildings including

Subject: Supply, Installation, Testing, Commissioning, Testing of **Expansion of existing IT (Data/Voice) Network and associate work to all buildings including** Training to concern officials, Technical support during warranty period as per requirement of this document and any other as per instructions of NATRAX to fulfill the requirements of this document**.**

1. **General:**

The current IT network infrastructure, established in 2019, was designed to support the Natrax-Hub building, which originally housed 22 employees. However, the staff count has significantly increased to approximately 80, with expectations for this number to rise to 100 soon. Additionally, the workforce is now distributed across multiple buildings, making it increasingly challenging for the existing network to meet the growing demands.

To ensure the continued smooth operations of the organization and provide the necessary support for the expanding workforce, the IT network must undergo a substantial expansion. This expansion should address key factors such as increased capacity, better connectivity across buildings, and enhanced performance to support the diverse needs of the employees.

The project will focus on upgrading the current infrastructure to accommodate the increased staff, streamline operations, and ensure efficient communication and collaboration across the various buildings. This involves expanding the network's capacity, ensuring robust security, and implementing modern technologies that facilitate seamless operations as the organization continues to grow.

2. **Submission of Bids**: Interested bidder may submit their respective bids on GeM Portal in two Packet Bidding system (separate Technical Bid and Financial Bid (in the format mentioned at sl.no. 07 "Bill of Quantities (BoQ)".

2.1. **Last date for Bid submission**: As per GeM Bid.

2.2. **Opening of bids:** the bids shall be opened on GeM Portal.

3. **Eligibility Criteria**: Bidder should meet the following eligibility criteria:

3.1. **Legal Valid Entity**: Bidder should be legal Valid Entity in form of Propritorship/LLP/Partnership/Pvt Ltd Company/PSU/Limited Company/Govt. Entity, copy of supporting documents including GST, PAN etc to be submitted in Technical Bid.

3.2. **Minimum Turnover /Financial Capability**: Bidder should have Minimum avarage annual audited turnover of **"Rs. 50/- Lakhs**" during Last 3 FYs (2021-22, 2022-23,2023-24) supporting documents including Audited Balance sheet/CA Certificate with UDIN

Number should be submitted in Technical Bid. Bidder should also submit Audited/Unaudited turnover for FY 2024-25.

3.3. **Minimum Experince/Technical Capability**: Bidder should have completed at least 3 similar works* in last 3 Years (cut of date for the same shall be 31st March 2025).

Similar works*: SITC of IT infrastructure/Networking setup Including Laying of Fiber Cables for any Reputed Pvt Entity/Govt entity.

Supporting documents either in form of copy of completion certificate with work order/Purchase order should be submitted in technical bid. NATRAX reserve the rights to call TDS Certificate /26AS from any or all bidders to check the genuineness of the certificates.

3.4. **Local Presence**: Bidder should have office in Indore/Dhar, copy of supporting documents in form of Shop establishment certificate/GST should be enclosed in technical bid.

3.5. **OEM Authorization:** Bidder should have OEM or Authorized Partner /Service provider/of OEM, copy of Authorization Certificate should be submitted in Technical Bid.

3.6. **Acceptance of Terms and conditions**: Bidder should have to submit sealed and signed copy of this documents/bid documents token as acceptance of all terms and conditions. Bidder may also submit a certificate on its letter head undertakes acceptance all terms and conditions of the bid number. The copy should be submitted in techncial bid.

3.7. **Technical Specification Compilation**: Bidder need to fill all the compliance as maintained at sl. no. 06 "Technical Specifications" of this document. Same should be submitted in technical bid.

4. **Other terms and conditions**:

4.1. **Payment**: 80% of the invoice value shall be release on completion of work after due certification from NATRAX. 10% shall be released after 1 year from the date of completion of work. Balance 10% shall be release on after successful completion of warranty period.

4.2. **Warranty period**: 3 years from the date of completion of work OR as per OEM warranty which ever is higher.

4.3. **Performance Security**: 5% of the contract amount in favour of 'National Automotive Test Tracks (NATRAX)' payable at 'Pithampur' in form of FDR/BG from any schedule bank. The performance security should be valid for at least 38 months from the date of issuance.

4.4. **Work completion period**: **4 months** from the date of issuance of work order, failing which NATRAX reserve the right to impose LD @ 0.1% per day up to maximum 10% of the contract amount for the delay attributable to the contractor.

4.5. **Per bid meeting**: Prebid meeting for this tender is scheduled by NATRAX at NATRAX HQ, Pithampur on the date as indicated in GeM, interested bidder may visit for the same.

5. Scope of work:

The scope of work consists of supply, installation, configuration, commissioning and service support of Local Area Network as enclosed design. The support service should be for one year onsite as and when required. The following activities, but not limited to, shall be performed by the bidder under the scope of said work –

- **a)** Supply of all Active and Passive components as per BOQ.
- **b)** Laying of OFC /CAT6 Cable as per requirement and as per drawing enclosed herewith.
- **c)** Installation, Configuration and Commissioning of equipment.
- **d)** Ensure proper functioning of overall VLAN's/ LAN, active and passive components.
- **e)** Onsite support.
- **f)** Deliverables & Documentation.
- **g)** General requirements.

The Bidder shall be responsible for providing all materials, equipment and specified services, which are required to fulfill the intent of ensuring operability, maintainability and reliability of the complete system covered under scope of work. This work shall be in compliance with all applicable standards, statutory regulations and safety requirements in force of the date of award of this contract.

The bidder shall also be responsible for deputing qualified personnel for installation, configuration, testing, commissioning and other services under scope of work and as per the requirement of the project and enclosed design for reference (Annexure – 'X').

The detailed description of each function is as follows:

5.1. Supply of all Active and Passive components as per RFP.

The bidder will supply Layer-3 and Layer-2 managed switches and other required networking equipment & accessories as per RFP at NATRAX.

- **a)** The core switch proposed by the bidders must be in High Availability (HA).
- **b)** All switches shall be connected through an Optical Fiber cable.
- **c)** Equipment furnished shall be completed in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/or needed for erection, completion and safe

operation of the equipment as required though they may not have been specifically detailed in the tender document, unless included in the list of exclusions.

5.2. Installation, Configuration and Commissioning of equipment's

Installation, Configuration and Commissioning of switches and other networking components as per NATRAX requirement to implement the desired topology and interfacing with the existing Network.

The following network devices configuration (Switch) shall be carried out by the firm: -

a) Configure the switches for VLAN & DMZ.

b) Network access control list configuration for controlling traffic in and out of one or more subnets.

c) Spanning Tree Protocol setting enables building a loop-free network.

d) BPDU guard prevents loops.

e) Spanning Tree Protocol Root guard Configuration on Layer 3 & Layer 2 Distribution Switch to prevent a port from becoming root port or blocked port.

f) Telnet Services Configuration for Remote Connection/ Web Services/ Time out.

g) VTP/GVRP Configuration at Layer3 Switch

h) (VLANs on Layer-3 switch and all Layer-2 switches synchronize).

i) Simple Network Management Protocol setting configuration as disables.

j) Dynamic Trucking Protocol on Layer-2 Switches setting configuration as disables

k) SSL Ciphers updation.

l) Syslog Logging.

m) Time Synchronization with the Database Server/Servers.

n) Switch Port Security Configuration.

o) BOOTP Service/ DHCP Configuration (Layer-3).

p) IP Source Routing Configurations setting to Disable.

q) Proxy ARP Configurations setting to Disable.

r) ICMP Unreachable Messages Configurations setting.

(Note-The above Network Configuration Setting may vary to get actual desired security)

5.3. Laying of Optical Fiber Cale cable as per the given design/NATRAX instructions.

The Service Provider is required to provide cable services (like cable laying and installation of OFC passive components) and other related works as and when required.

a) Laying and termination of Optical Fiber cable from each Point of switch/Network Rack (Layer-2 switches) installed at different locations of existing building to respective user node as per design.

b) Laying of Outdoor Optical Fiber cable should be through HDPE Pipe with atleast 1.5 mtr digging including all required materials as per the requirement of site with preparing the proper junction. All cabling must be "Structured".

c) Installation, Integration & Labeling of all the Racks and Switches etc. with all proper connections.

d) There should not be any hanging or uncovered wire.

e) Execution of minor civil works as per the requirement of work will be the responsibility of the bidder.

f) While installation of OFC, the bidder shall ensure day-to-day functioning of official work and existing network setup/connectivity/internet connectivity should not get disrupted.

g) The bidder must provide the required tools and other accessories, which are necessary for installation of the OFC Cabling. No separate charges for fixing/crimping/other connection charges would be paid by NATRAX.

h) System covered under the scope of work, including integration and interoperability with the existing Network.

i) After installation and configuration of each and every switch, Fiber cable, junction BOX etc., tests shall be conducted for system performance as a whole.

j) Integration and proper functioning with the existing UTM firewall as per the requirement of topology to be designed.

5.4. On Site Support

a) Onsite support for one year for installed system.

b) Assistance for familiarization and operation of the installed system & support services for 01 year as and when required after acceptance of system.

c) NATRAX shall register the complain/fault if any through phone, email, etc.

d) The bidder will accordingly visit the site within 48 hours on working day to resolve the issues.

e) The Service Provider would be required to accomplish the tasks within stipulated timelines to avoid penalty.

f) NATRAX will not pay any additional amount of services/ Labour/ transportation charges for carrying out the repair maintenance work during service support period.

g) During service support period, the firm shall repair/replace the faulty material which is under warranty. If material to be replaced then it should be replaced with the materials which are of equal or higher specifications.

h) In case of critical activities or in emergency situations, the firm will have to deploy engineers urgently on same day (even on holidays).

i) While carrying out the repair & maintenance activities, the firm shall ensure that the network services for other users will not be impacted. If there is a possibility of such disruption, then the firm must do the same while starting the work.

5.5. Deliverables & Documentation

a) The firm shall provide Implementation plan, to be approved by NATRAX before initializing the installation, configuration and commissioning activity.

b) The firm shall provide Network Documentation and Product warrantee card.

c) The firm shall provide acceptance test reports, and performance test reports of networking components. The service provider will have to submit OTDR report for all the installed network points, wherever applicable.

d) Any other Relevant Documentation.

6. Techncial Specifications:

6.1. 24 port Gigabit stackable switch with additional 6 SFP+ ports (Layer 3): Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

24 port Gigabit stackable switch with additional 6 SFP+ ports (Layer 3)			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	**General Features**		
1.1	The switch should support a minimum of 24 nos. 10/100/1000 Ethernet Ports		
1.2	The switch should support a minimum of 4x1GE SFP Uplinks loaded with 6x10GE SFP+ modules from the same OEM as the switch		
1.3	Should allow VSF stacking on the additional 2x10G SFP+ slots with DAC cable from the same OEM as the switch		
2	**Performance and Scalability**		

2.1	The switch should support Full-duplex Switching bandwidth of 176 Gbps		
2.2	The switch should support 64-Byte Packet Forwarding Rate of 131 Mpps		
2.3	The switch should support at least 128MB flash memory		
2.4	The switch should support minimum 1 GB RAM		
2.5	The switch should support 1024 active IP Interfaces		
2.6	Should support routing table with 10K routing entries		
2.7	The switch should support 4094 VLAN IDs		
2.8	The switch should support Jumbo frames of 14K		
2.9	The switch should support Maximum transmission unit (MTU) of 10K		
2.10	The switch should support 90K MAC addresses		
3	**Stacking**		
3.1	The Switch architecture should be able to stack 4 switches together with virtual stacking in HA mode		
3.2	The Switch stack should be based on Distributed forwarding Architecture, where in each stack member forwards its own information on network.		
3.3	The Switch stacking should support 40 Gbps of throughput.		
3.4	The Switch stacking should support single IP address management for the group of switches.		
4	**Dimension**		
4.1	The Switch should be 1RU		
4.2	The switch should support Operating temperature from 0°to 45°C		
4.3	The switch should support Operating relative humidity 15% to 90% noncondensing		
4.4	Switch dimension and weight to be specified		
5	**Power Supply**		
5.1	The switch should support an modular AC Power supplies + 1 optional AC (100~240VAC, 50~60Hz)		
6	**Standards**		
6.1	The switch should support IEEE 802.1D Spanning Tree Protocol		
6.2	The switch should support IEEE 802.1p		
6.3	The switch should support IEEE 802.1Q Trunking		
6.4	The switch should support IEEE 802.1s Multiple Spanning Tree (MSTP)		
6.5	The switch should support IEEE 802.1w Rapid Spanning Tree (RSTP)		
6.6	The switch should support IEEE 802.1x		
6.7	The switch should support SNMP v1, v2c, and v3		
7	**Layer-2 Features**		
7.1	The switch should support IEEE 802.1Q VLAN encapsulation.		

7.2	The switch should support Per-port multicast storm control to prevent faulty end stations from degrading overall systems performance		
7.3	The switch should support Per-port unicast storm control to prevent faulty end stations from degrading overall systems performance		
7.4	The switch should support Auto-negotiation on all ports to automatically selects half- or full- duplex transmission mode to optimize bandwidth		
7.5	The switch should support IGMP v1, v2 Snooping		
7.6	The switch should support IGMP v3 Snooping Multicasting		
7.7	The switch should support IGMP v1, v2 Filtering		
8	**Layer-3 Features**		
8.1	The switch should support Static Routing, RIPv1/v2,RIPng, OSPFv2, BGP4, OSPFv3, BGP4+, IS-IS		
8.2	The switch should support LPM Routing		
8.3	The switch should support Policy-based Routing(PBR) for IPv4 and Ipv6		
8.4	The switch should support VRRP, URPF, ECMP, BFD, IGMP v1/v2/v3, IGMP Proxy		
8.5	The switch should Static Multicast Route, Multicast Receive Control, Illegal Multicast Source Detect		
8.6	The switch should support ARP Guard, Local ARP proxy, Proxy, ARP, ARP Binding, Gratuitous ARP, ARP Limit		
9	**Network security features**		
9.1	The switch should support IEEE 802.1x to allow dynamic, port-based security, providing user authentication.		
9.2	The switch should support Port-based ACLs for Layer 2 interfaces to allow application of security policies on individual switch ports.		
9.3	The switch should support SSHv2 and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.		
9.4	The switch should support TACACS+ and RADIUS authentication enable centralized control of the switch and restrict unauthorized users from altering the configuration.		
9.5	The switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network.		
9.6	The switch should support Private VLAN, Guest VLAN, or equivalent		
9.7	DNS Client, DNS Relay, GRE Tunnel		
9.8	Switch supports ERPS G.8032, recovery time <50ms		
10	**DHCP Features**		

10.1	The switch should support DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses DHCP binding database, and to rate-limit the amount of DHCP traffic that enters a switch port.		
10.2	The switch should support DHCP Option 82 data Insertion		
10.3	The switch should support DHCP Server/Client for IPv4/IPv6		
11	**Manufacturing and Support**		
11.1	The OEM should have its manufacturing unit in India for the past 10 years		
11.2	OEM should be selling their products in the Indian market for the past 25 years		
12	**Warranty**		
12	The switch should have 3 Years warranty support for hardware and software support		

6.2. PoE 24 port Gigabit switch 4 x 10G (Layer 2 Managed Switch): Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

PoE 24 port Gigabit switch 4 x 10G (Layer 2 Managed Switch)			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	**General Features**		
1.1	The switch should support 24 nos. 10/100/1000 Ethernet Ports		
1.2	Should support PoE on all 24 copper ports		
1.3	The switch should support a minimum of 4 SFP+ Uplinks.		
1.4	The switch should support Auto or configurable MDI/MDIX mode to automatically detect and work on Half/full-duplex for 10/100 Mbps and full-duplex for 1000 Mbps speeds		
2	**Performance and Scalability**		
2.1	The switch should support Full-duplex Switching bandwidth of 128 Gbps		
2.2	The switch should support 64-Byte Packet Forwarding Rate of 95 Mpps		
2.3	The switch should support minimum 16 MB of Flash memory		
2.4	The switch should support 256 MB of DRAM		
2.5	The switch should support 64 VLANs		
2.6	The switch should support 4096 VLAN IDs		
2.7	The switch should support Jumbo frames of 9216 bytes		

2.8	The switch should support Maximum transmission unit (MTU) of 9K		
2.9	The switch should support 16000 Unicast MAC addresses		
3	**Stacking**		
3.1	The Switch architecture should be able to stack 4 switches together with virtual stacking		
3.2	The Switch stack should be based on Distributed forwarding Architecture, where in each stack member forwards its own information on network.		
3.3	The Switch should support Stateful Switchover (SSO) when switching over from Active to Standby switch in a Stack.		
3.4	The Switch stacking should support 40 Gbps of throughput.		
3.5	The Switch stacking should support single IP address management for upto 16 groups of switches.		
4	**Dimension**		
4.1	The Switch should be 1RU		
4.2	The switch should support Operating temperature from 0°to 50°C		
4.3	The switch should support Operating relative humidity 15% to 90% noncondensing		
5	**Power Supply**		
5.1	The switch should support an auto-ranging power supply with input voltages between 100 and 240V AC.		
5.2	Power over Ethernet Budget 370W		
5.3	All ports should support IEEE802.3af & IEEE802.3at		
5.4	The switch should support an auto-ranging power supply with input voltages between 100 and 240V AC.		
5.5	The switch should support enough ventilation with 2 fans per unit		
5.6	All Ethernet ports should support IEC61000-4-5-6 kV surge protection		
6	**Standards**		
6.1	The switch should support IEEE 802.1D Spanning Tree Protocol		
6.2	The switch should support IEEE 802.1p		
6.3	The switch should support • IEEE 802.3 10BASE-T Ethernet • IEEE 802.3u 100BASE-TX Fast Ethernet • IEEE 802.3ab 1000BASE-T Gigabit Ethernet • IEEE802.3z(1000BASE-X) • IEEE 802.3ae 10G Ethernet, IEEE 802.3af/at • IEEE 802.3x Flow Control for full-duplex mode, auto-negotiation		
6.4	The switch should support IEEE 802.1Q Trunking		
6.5	The switch should support IEEE 802.1s Multiple Spanning Tree (MSTP)		

6.6	The switch should support IEEE 802.1w Rapid Spanning Tree (RSTP)		
6.7	The switch should support IEEE 802.1x		
6.8	The switch should support SNMP v1, v2c, and v3		
7	**Layer-2 Features**		
7.1	The switch should support IEEE 802.1Q VLAN encapsulation.		
7.2	The switch should support Centralized VLAN Management. VLANs created on the Core Switches should be propagated automatically.		
7.3	The switch should support Per-port multicast storm control to prevent faulty end stations from degrading overall systems performance		
7.4	The switch should support Per-port unicast storm control to prevent faulty end stations from degrading overall systems performance		
7.5	The switch should support Auto-negotiation on all ports to automatically selects half- or full- duplex transmission mode to optimize bandwidth		
7.6	The switch should support IGMP v1, v2 Snooping		
7.7	The switch should support IGMP v3 Snooping Multicasting		
7.8	The switch should support IGMP v1, v2 Filtering		
8	**Layer-2 Features**		
8.1	The switch should support Static Routing, RIPv1/v2, OSPFv2, OSPFv3		
8.2	The switch should support LPM Routing		
8.3	The switch should support Policy-based Routing (PBR) for IPv4 and Ipv6		
8.4	The switch should support VRRP, ECMP, BFD, IGMP v1/v2/v3, IGMP Proxy		
8.6	The switch should support ARP Guard, Local ARP proxy, Proxy, ARP, ARP Binding, Gratuitous ARP, ARP Limit		
9	**Network security features**		
9.1	The switch should support IEEE 802.1x to allow dynamic, port-based security, providing user authentication.		
9.2	The switch should support Port-based ACLs for Layer 2 interfaces to allow application of security policies on individual switch ports.		
9.3	The switch should support SSHv2 and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.		

9.4	The switch should support TACACS+ and RADIUS authentication enable centralized control of the switch and restrict unauthorized users from altering the configuration.		
9.5	The switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network.		
9.6	The switch should support Private VLAN, Guest VLAN, or equivalent		
9.7	Switch supports ERPS G.8032, recovery time <50ms		
9.8	The switch should support Q-in-Q, flexible Q-in-Q		
10	**DHCP Features**		
10.1	The switch should support DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses DHCP binding database, and to rate-limit the amount of DHCP traffic that enters a switch port.		
10.2	The switch should support DHCP Option 82 data Insertion		
10.3	The switch should support DHCP Server/Client for IPv4/IPv6		
11	**Management and Interface**		
11.3	The switch supports OAM IEEE802.3ah/802.1ag		
12	**Warranty**		
12	The switch should have 3 Years warranty support for hardware and software support		

6.3. PoE_8 port Gigabit switch 2 x 1G (Layer 2 Managed Switch): Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

PoE_8 port Gigabit switch 2 x 1G (Layer 2 Managed Switch)				
Make:				
Model:				
Sr No	**Technical Specifications**		**Comply (Yes/No)**	**Deviations, if any**
	Parameter	**Description**		
1	Form Factor	Rack Mountable		
2	Architecture	Non-Blocking		
3	Ports	8 Port 10/100/1000 with PoE Web Managed Switch + 2 Fiber SFP ports		
4	GBIC/SFP	It should support 2 No's 1000 Base mini GBIC/SFP tans receivers LC connector for connecting single mode fibre (LX)		
5	PoE	75W (PoE+ supported)		

6	Port Status	Display Each port must have a dedicated LED status display.		
7	MAC Addresses	Supported Up to 8K MAC addresses		
8	Switching capacity	At least 20 Gbps		
9	Forwarding rate	Packet throughput 14 Mbps or more		
10	VLANs Supported	Support for up to 4096 VLANs simultaneously Port-based and 802.1Q tag-based VLANs MAC-based VLAN		
11	Management	Web Management		
		Traceroute; single IP management; HTTP; SSH; RADIUS; port mirroring; TFTP upgrade; DHCP client; BOOTP; SNTP; cable diagnostics; ping; syslog; Telnet client (SSH secure support)		
		RMON		
12	L2 Loop Protection	IEEE 802.1d Spanning tree protocol		
		IEEE 802.1W RSTP(Rapid spanning Tree Protocol)		
		IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)		
13	Link Aggregation	Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP)		
		● Up to 8 groups		
		● Up to 8 ports per group with 16 candidate ports for each (dynamic) 802.3ad link aggregation		
14	QOS Support	Atleast 4 nos of 802.1p Priority Queues per Port.		
15	Port mirroring /span Port	Traffic on a port can be mirrored to another port for analysis with a network analyser or RMON probe. Up to 8 source ports can be mirrored to one destination port. A single session is supported.		
16	TFTP or FTP Support	For Configuration file backup and restore.		
17	Port Security	The ability to lock Source MAC addresses to ports and limits the number of learned MAC addresses.		

18	Access Control	Should support standard and extended ACLS. Should support various types of ACLS like port based/time based.		
19	Power	AC Input 100-240V AC. 54VDC/1.67 A		

6.4. Multimode & Dual Port 10G SFP+: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

Multimode & Dual Port 10G SFP+				
Make:				
Model:				
Sr No	**Technical Specifications**		**Comply (Yes/No)**	**Deviations, if any**
	Parameter	**Description**		
1	**Architecture**	1-port mini-GBIC LX SFP + LC Type Transceiver		
2	**Connector**	It should have duplex LC Connector		
3	**Flow control.**	Support 802.3e		
4	**Mode**	9/125 um Single mode Fiber Type up to 10 KM.		
5	**Support wavelength**	:1310nm		
6	**Power Support:**	3.3V		
7	**Case Operating Temperature:**	support up to 0^{o}~70^{o}		
8	**Storage Relative Humidity:**	support upto 5% to 95%		

6.5. Multimode & Dual Port 1G SFP: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

Multimode & Dual Port 1G SFP				
Make:				
Model:				
Sr No	**Technical Specifications**		**Comply (Yes/No)**	**Deviations, if any**
	Parameter	**Description**		
1	**Architecture**	1-port mini-GBIC LX SFP LC Type Transceiver		
2	**Connector**	It should have duplex LC Connector		
3	**Flow control.**	Support 802.3e		
4	**Mode**	9/125 um Multi mode Fiber Type up to 10 KM.		
5	**Support wavelength**	:1310nm		
6	**Power Support:**	3.3V		
7	**Case Operating Temperature:**	support up to 0^{o}~70^{o}		

8	**Storage Relative Humidity:**	support upto 5% to 95%		

6.6. CAT6 UTP PATCH PANEL: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

CAT6 UTP PATCH PANEL			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	Category 6 patch panel with two-piece structure, 24 port panel frame and Cable management frame. Cold Rolled Steel material powder coated to black color. Plastic bezel 6 x 4 format with port label identification on each port		
2	Compatible with Standard 1U 19-inch rack mounted.		
3	Loaded with 24 nos' individual RJ45 keystone jacks		
4	Category 6 Keystone 30 Micron Gold Plating Suitable for 23~24 AWG Solid Copper Wire, Easy for Termination and Compliant to T568A and T568B Wiring Schemes,		
5	Efficient design IDC terminals to punch/terminate cables with standard punch down tool		
6	Wiring cap with strain relief function for better holding of terminated/punched cable wires.		
7	Fast, Easy, Reliable Termination		
8	Reliable IDC contacts with color coding for better contact resistance and transmission		
9	Spring operated in-built collapsible shutter to prevent from entry of dust		
10	Backward compatible with both RJ11/RJ12 Plug		
11	**Physical Specification:**		
11.1	Plastic parts: High impact flame retardant plastic, Polycarbonate UL 94V-0 rated		
11.2	Panel frame and Cable management: SPCC graded cold rolled steel powder coated to black color		
11.3	PCB: FR4, 1.2mm Thickness		
11.4	Jack Wire Terminals: Phosphor bronze base, gold over nickel plating		
	Gold Plating: 30µ, Nickel Plating Base (Ni) : 40µ~80µ		
115	IDC Terminals: Insulation displacement connector: Phosphor bronze base, Tin Plated 100µ		

11.6	(IDC) Accept #23~24 AWG solid copper wire		
11.7	Panel Size: 483mm x 134mm x 44.3mm (LxWxH)		
11.8	Numbered port paper labeling with transparent window cover for the label.		
12	**Electrical Specification:**		
12.1	Current Rating: 1.5 Amps		
12.2	Insulation Resistance: 500 MΩ minimum		
12.3	Contact Resistance: 10 mΩ maximum		
12.4	DC Resistance: 0.1 Ω maximum		
12.5	DC 1000V/AC 750V for 1 min.		
13	**Mechanical Specification:**		
13.1	Plug Insertion Life: 750 Cycles minimum using FCC-approved plug		
13.2	Plug & Jack Contact Force :100 Grams minimum using FCC-approved plug		
13.3	Plug Retention Force: 11.0 lbf minimum		
13.4	Durability: 200 Termination cycles		
13.5	Storage Temperature: -40°F to 150°F (-40°C to 68°C)		
	Operating Temperature : -10°C to 60°C		
14	**Standard Verification:**		
14.1	Qualified unscreened Class E/Cat.6.		
14.2	Channel ANSI/TIA-568-C.2		
14.3	IEC 60603-7-4 2nd Edition		
14.4	ISO/IEC 11801 2.2 Edition		
14.5	RoHS Directive 2002/95/EC/Compliant		

6.7. LIU Unloaded: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

LIU Unloaded			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	The Fiber Rackmount LIU unloaded having Adapter panel fixed on drawer base frame, without Adapters and without Pigtails, but assembled with splice tray as per the fiber port requirement and their applicable accessories.		
2	Suitable to mount at different positions (depth wise) on standard 1U 19 inch racks. Drawer type to pull out for easy maintenance when assembled in racks.		
3	Cold Rolled Steel material with black powder coating		
4	Three types of cable entry holes for different size cables through cable glands, covered with rubber cable grommets/covers.		

5	Splicing of 24 fibers in each plastic fiber splicing trays with integrated cable spool design.		
6	Non removable top cover and no rear cover. Drawer type to pull out for better access of interior.		
7	Suitable for assembling 6/12/24/48 (SC/LC, Simplex/Duplex) adapters on rackmount ports.		
8	Accessories kit consists of Cable management rings/Cable saddles (6 no's), Cable glands (PG13.5, 2 no's), Splice rods (24/48 no's), Blanking clips (24 no's), Velcro ties (12 nos.), Cable ties (6 nos.), Cable inlet/outlet hole covers (2 types, 2 no's each)		
9	Cable management rings/Cable saddles can be mounted inside the rackmount, no provision to mount outside in front of the adapter panel.		
10	Suitable for storing up to 3 meters of 900 µm tight buffered fiber pigtail per adapter.		
11	Panel Dimensions: 482 x 220 x 44.3 mm (Length x Width x Height)		
12	Splice Tray Dimensions: 220 x 90 x 15 mm (Length x Width x Height)		
13	Port identification numbers printed on the Adapter panel		
14	Standards: Comply as per ANSI/TIA-568-C.3, ISO/IEC 11801, RoHS Compliant.		
15	Operating Temperature: -20 °C to +70° C Installation Temperature: -20 °C to +70° C		

6.8. LIU Fiber Adapter: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

LIU Fiber Adapter			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	Types of Adapter SC, LC both in Single mode and Multimode, Simplex and Duplex Versions		
2	Should be able to snap mount with metal clip or screw mount		
3	Main body made of Plastic (Polyetherimide) for LC type and (Polybutylene terephthalate) for SC type		
4	Sleeve Material: Zirconia Sleeve (for Single mode) and Zirconia/Phosphor Bronze sleeve (for Multimode)		
5	Push Pull latching system mechanism for patch cord or pigtail		
6	Colour of Adapters: PC type (Blue-SM, Beige-MM) APC type (Green-SM)		
7	Plastic cover/cap on both sides of the adapters to prevent dust entry		

8	Insertion Loss should be ≤ 0.3 dB.		
9	Plug Retention Force should be 68N minimum		
10	Durability should be ≤ 0.2 dB for 1000 matings.		
11	Storage Temperature: -20^{0}C to +70^{0}C Installation Temperature: -20^{0}C to +70^{0}C Operating Temperature: -20^{0}C to +70^{0}C		
12	Standards: Comply to ANSI/TIA-568-C.3, ISO/IEC 11801, RoHS Compliant,		

6.9. Pigtail Multi Mode: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

Pigtail Multi Mode			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	Fiber optic pigtail with one core (Simplex) fiber cable terminated with SC/LC/ST/FC connector at one end and no connector at other end.		
2	The terminated connectors in assemblies are designed and are compatible with industry standards (ANSI/TIA-568-C.3, ISO/IEC 11801).		
3	Have good geometrical characteristics of apex offset & radius of curvature & fiber height		
4	100% factory terminated and tested for optical characteristics & fiber end face finish.		
5	Fiber type OM1(62.5/125 µm), OM2, OM3, OM4 (50/125 µm)		
6	Tight Jacketed fiber with Cable Diameter: 0.9 ± 0.05 (Simplex)		
7	Jacket color: Orange (OM1/OM2), Aqua (OM3/OM4) Jacket Material: LSZH		
8	Connector Ferrule: Ceramic, Apex Offset should be <50um, Fiber height should be ±100nm		
9	Connector Repeatability ≤ 0.2dB with 1,000 times mating cycles.		
10	Connector cable retention: 3 N (0.67 lbs), Crush resistance : 100N/100mm, Bend Radius: 20 x Diameter of cable		
11	Attenuation : (OM1) ≤ 3.5 dB/km (@850 nm), ≤ 1.5 dB/km (@1300 nm) (OM2, OM3, OM4) ≤ 3.0 dB/km (@850 nm), ≤ 1.0 dB/km (@1300 nm)		
12	Band Width : (OM1) (≥ 200 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm) (OM2) (≥ 500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm) (OM3) (≥ 1500 MHz.km (@850 nm), ≥ 500		

	MHz.km (@1300 nm) (OM4) (≥ 3500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm)		
13	Insertion Loss (@850 & 1300nm) : SM (UPC/PC) Type : SC/LC/ST/FC : ≤ 0.3 dB Return Loss (@850 & 1300nm) : SM (UPC/PC) Type : SC/LC/ST/FC : ≥ 30 dB		
14	Insertion Loss (@850 & 1300nm) : SM (APC) Type : SC/LC/ST/FC : ≤ 0.3 dB Return Loss (@850 & 1300nm) : SM (APC) Type : SC/LC/ST/FC : ≥ 60 dB		
15	Traceability sticker available for product tracking and Interferometry report need to submit		
16	Standards: IEC 60332-1, ANSI/TIA-568-C.3, ISO/IEC 11801 RoHS Compliant		
17	Installation Temperature: -20 °C to +70° C, Operating Temperature : -20 °C to +70° C		
18	Available in various length in meters		

6.10. Fiber Patch Cord - Multi Mode: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

Fiber Patch Cord - Multi Mode			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	Fiber optic patch cord with two core (Duplex) / one core (Simplex) fiber cable terminated with SC/LC/ST/FC connector at one end and SC/LC/ST/FC connector at other end.		
2	The terminated connectors in assemblies are designed and are compatible with industry standards (ANSI/TIA-568-C.3, ISO/IEC 11801).		
3	Have good geometrical characteristics of apex offset & radius of curvature & fiber height		
4	100% factory terminated and tested for optical characteristics & fiber end face finish.		
5	Fiber type OM1(62.5/125 µm), OM2, OM3, OM4 (50/125 µm)		
6	Buffer Diameter: 0.9 ± 0.05 mm, Jacket Thickness: 0.35 ± 0.05 mm, Strength Member as Aramid yarn		
7	Cable Diameter: 2.0 0.2 (Simplex), 2.0 x 3.8 ± 0.2 (Duplex)		
8	Jacket color: Orange (OM1/OM2), Aqua (OM3/OM4) Jacket Material: LSZH		

9	Connector Ferrule: Ceramic, Apex Offset should be <50um, Fiber height should be ±100nm		
10	Connector Repeatability ≤ 0.2dB with 1,000 times mating cycles.		
11	Connector cable retention : 50 N (11.24 lbs), Crush resistance : 100N/100mm, Bend Radius: 20xDiameter of cable		
12	Attenuation : (OM1) ≤ 3.5 dB/km (@850 nm), ≤ 1.5 dB/km (@1300 nm) (OM2, OM3, OM4) ≤ 3.0 dB/km (@850 nm), ≤ 1.0 dB/km (@1300 nm)		
13	Band Width : (OM1) (≥ 200 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm) (OM2) (≥ 500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm) (OM3) (≥ 1500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm) (OM4) (≥ 3500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm)		
14	Insertion Loss (@850 &1300nm) : SM (UPC/PC) Type : SC/LC/ST/FC : ≤ 0.3 dB Return Loss (@850 &1300nm) : SM (UPC/PC) Type : SC/LC/ST/FC : ≥ 30 dB		
15	Insertion Loss (@850 &1300nm) : SM (APC) Type : SC/LC/ST/FC : ≤ 0.3 dB Return Loss (@1310 &1550nm) : SM (APC) Type : SC/LC/ST/FC : ≥ 60 dB		
16	Traceability sticker available for product tracking and Interferometry report need to submit		
17	Standards: IEC 60332-1, ANSI/TIA-568-C.3, ISO/IEC 11801 RoHS Compliant		
18	Installation Temperature : -20 °C to +70° C, Operating Temperature : -20 °C to +70° C		
19	Available in various length in meters		

6.11. CAT-6 Patch Cord 10G: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

CAT-6 Patch Cord 10G			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	Category 6 patch cords with four pair twisted stranded copper wire cable terminated with RJ45 modular plugs at both the ends.		
2	Patch Cords 100% factory tested for better quality and suitable for the high speed data transmission.		

3	Complies with the ANSI/TIA/EIA-568-C.2, ISO/IEC 11801, RoHS compliant Standard. Supports Data Networks Speeds Up to 10/100-Base-T and 1000-Base-T.		
4	Patch cord with LSZH jacket to reduced toxic/corrosive gasses emitted during combustion		
5	Transparent modular plugs with transparent slip on boot and cable assemblies		
6	T568B wiring scheme crimped at both connector ends.		
7	Available in different colors and different length on request		
8	Patch cord conductor: 24 AWG, Stranded copper wires, Insulation : HDPE		
9	Connector Plug: 30µ'' Gold plated contact, Phosphor Bronze base material		
10	Jacket Diameter : 5.8 ± 0.1mm		
11	Plug Insertion/Extraction Life: 750 Cycles min. using FCC approved plug		
12	Plug & Jack Contact Force : 100 Grams min. using FCC approved plug		
13	Plug Retention Force : 11 lbf min.		
14	Current Rating: 1.5 amps, Voltage Rating: 72 Vdc max.		
14	Insulation Resistance : 500MΩ min, Contact Resistance : 20mΩ max, DC Resistance: 0.1Ω max.		
15	ETL Verified 4-Connector Channel performance certificate		
16	Operating Temperature : -20 °C to +70° C Installation Temperature : -20 °C to +70° C		

6.12. RJ-45 Connector: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

RJ-45 Connector			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	RJ-45 modular plugs for Local Area Network (LAN) and computer Applications, Suitable for Cat 6 Solid or Stranded cable, 3-Prong Design for accurate termination		
2	Current Rating: 250V AC max, at 2A		
3	Dielectric withstanding: 1000V DC/min, <0.5A		
4	Insulation Resistance: >500MΩ, 1000V DC/min.		
5	Contact Resistance: <20 MΩ		
6	Cable to plug tensile strength: 20lbs(89N) min		
7	Durability: above 750 mating cycles		
8	Temperature for operation: -40°C to +125°C		
9	Housing material: Polycarbonate UL94V-0		
10	Gold plating thickness: Gold flash 3MU"		
11	RoHS compliant		

6.13. OFC Armoured Multimode OM2 12F: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

OFC Armored Multimode OM2 12F			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
1	06/08/12/24-Core, Multimode 62.5/125, 50/125 micron primary coated buffers, Armored Loose Tube, ECCS (Electrolytic Chrome Coated Steel) Tape, Jelly Filled Loose Tube.		
2	Two Steel Wires/Rods embedded in outer periphery of the jacket as strength members. UV Stabilized jacket and protected from Rodent attacks		
3	Complying to ANSI/TIA-568-C.3, ISO/IEC 11801, Telecordia GR-20 Core, IEC 60793-1/60794-1, EN 50173, RoHS Compliant		
4	Suitable for use in indoor/outdoor ducts, direct burial and backbone cabling		
5	Loose tube material : Polybutylene Terephthalate (PBT) with Natural/White Colour having Inner Diameter/Outer Diameter 1.7/2.5 ± 0.1 mm		
6	Peripheral strength member as two steel wires/rods having dimensions as 0.6 ± 0.05 mm		
7	Moisture Barrier as Water Swellable Tape, Armouring ≥ 0.150 mm (ECCS Tape), Number of Ripcords as 01 no polyester based yarns.		
8	Outer sheath material as HDPE/LSZH with diameter as 7.5/8.5 ± 0.5 mm having thickness of 1.5mm nominal		
9	Weight of the cable for 04/06/0812 core (HDPE/LSZH): 65.0/75.0 ± 10 kg/km, for 24 core (HDPE/LSZH): 75.0/95.0 ± 5 kg/km		
10	Fiber color and Loose tube color as per ANSI/TIA standards.		
11	Tensile Strength : 1000 N, Crush Resistance : 4000 N/100mm		
12	Minimum bend radius : 20 x Diameter (during installation), Minimum bend radius : 10 x Diameter (during full load)		
13	Fiber Type : 62.5/125 (OM1), 50/125 (OM2,OM3,OM4)		
14	Attenuation : 62.5/125(OM1) (≤ 3.5 dB/km (@850 nm), ≤ 1.5 dB/km (@1300 nm)		
	50/125 (OM2) (≤ 2.7 dB/km (@850 nm), ≤ 0.8 dB/km (@1300 nm)		
	50/125 (OM3) (≤ 3.0 dB/km (@850 nm), ≤ 1.0 dB/km (@1300 nm)		

	50/125 (OM4) (≤ 3.0 dB/km (@850 nm), ≤ 1.0 dB/km (@1300 nm)		
15	Band Width : 62.5/125(OM1) (≥ 200 MHz.km (@850 nm), ≥ 600 MHz.km (@1300 nm)		
	50/125(OM2) (≥ 500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm)		
	50/125(OM3) (≥ 1500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm)		
	50/125(OM4) (≥ 3500 MHz.km (@850 nm), ≥ 500 MHz.km (@1300 nm)		
16	Core Cladding Concentricity Error : ≤ 1.0 µm		
17	Cladding Diameter : 125 ± 1 µm , Coating Diameter : 250 ± 15 µm		
18	Cladding Non-circularity : ≤ 1 %		
19	Installation Temperature : -20 °C to +70° C, Operating Temperature : -20 °C to +60° C		
20	Cable Size and Standard Length: 4F to 12F : 4.0 kms ± 10%		
	24F : 2.0 kms ± 10%		

6.14. Wall Mount 9U Rack: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

Wall Mount 9U Rack			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
	Rack Size		
1	Wall Mount 9U-550W x 600D		
	Features:		
2	Conforms to DIN 41494 OR equivalent ISO Standards		
3	Adjustable 19" equipment mounting verticals provide better mounting flexibility and maximizes the usable mounting space		
4	Depth adjustable mounting slots		
5	Precision engineering capabilities and best efficient software configuration product technology provide the best product quality and fastest delivery in the industry		
6	Top and bottom Panel with ventilation and cable entry facility		
7	Provision to mount cooling fans on the top panel		
8	Powder coated finish with pre-treatment process meeting all industry standards		
9	Grounding and Bonding Options. 100% assured compatibility with all equipment conforming to DIN 41494 (General industrial standard for equipment)		

10	Front Door : Lockable Toughened Glass Door		
11	Mounting Angle : 19" Mounting angles made of formed steel		
12	Top and Bottom Cover : Welded to Frame, Vented and Field Cable entry exit cut outs		
13	Standard Accessories: Power Distribution Units, 1U Horizontal Cable Manager, FAN and one Hardware Packet		

6.15. Wall Mount 12U Rack: Bidder need to Comply all the parameters as given below, also confirm the make and models to be supplied under the tender:

Wall Mount 12U Rack			
Make:			
Model:			
Sr No	**Technical Specifications**	**Comply (Yes/No)**	**Deviations, if any**
	Rack Size		
1	Wall Mount 12U-550W x 600D		
	Features:		
2	Conforms to DIN 41494 OR equivalent ISO Standards		
3	Adjustable 19" equipment mounting verticals provide better mounting flexibility and maximizes the usable mounting space		
4	Depth adjustable mounting slots		
5	Precision engineering capabilities and best efficient software configuration product technology provide the best product quality and fastest delivery in the industry		
6	Top and bottom Panel with ventilation and cable entry facility		
7	Provision to mount cooling fans on the top panel		
8	Powder coated finish with pre-treatment process meeting all industry standards		
9	Grounding and Bonding Options. 100% assured compatibility with all equipment conforming to DIN 41494 (General industrial standard for equipment)		
10	Front Door : Lockable Toughened Glass Door		
11	Mounting Angle : 19" Mounting angles made of formed steel		
12	Top and Bottom Cover : Welded to Frame, Vented and Field Cable entry exit cut outs		
13	Standard Accessories: Power Distribution Units, 1U Horizontal Cable Manager, FAN and one Hardware Packet		

7. Bill of Quantities (BoQ)- SITC for Expansion of existing IT (Data/Voice) Network and associate work:

Supply BOQ (A)

S. No	Product	Item Description	Unit	Quantity	Rate (including GST)	Amount
1	L3 Managed Switch	24x 10/100/1000BASE-T ports +4x1G SFP ports + 6x10 GbE SFP+ uplink ports, <85W Power Consumption with Redundant Power Supply system, 10GbE SFP to SFP 1M Direct Attach Cable	No.	2		
2	L2 Managed Switch	24 Ports 10/100/1000Mbps PoE 4Ports 10G SFP+ Smart Managed Switch surge 6KV min 65Watts	No.	2		
		8Ports 101001000Mbps PoE 2Ports SFP+ 1001000Mbp Smart Managed Switch 65Watts	No.	7		
3	Module Single Mode & Dual port	10G SFP Multimode	No.	5		
		1G SFP Multimode	No.	22		
4	RACK: 550 W x 600 D - Grey Colour Front Glass Door (tinted, Toughened) with Lock & Key, 2 pairs of 19" Mounting Rails with U-Marking Welded Side Walls. Standard Accessories: 1U Cable Manager (1), Hardware Packet (1 Pkt) 6 Socket 5 Amp. Power Distribution Unit (1 No) Roof Mounted Fan Unit / 90 CFM /230V AC (1 No)	9U with Fan & PDU	No.	7		
		12U with Fan & PDU	No.	5		
5	Patch Panel Cat 6 UTP Keystone Type 24 Port Fully Loaded	24 Port	No.	12		
6	LIU Rack Mount Loaded LC SM + PIGTAIL LC SM625um OM1 SIMPLEX LENGTH 1m	6 Port	No.	12		
		12 Port	No.	3		
7	Cable Manager with Cover		No.	15		
8	Fiber patch cord Single	3 Mtr	No.	10		

	mode duplex LC style & Dual Port	5 Mtr	No.	5		
9	Fiber Junction Box	No	No.	20		
10	Cat6 Patch Cord (10G)	2 Mtr	No.	12		
		5 Mtr	No.	12		
11	RJ 45 Connector	Pkt	Packet	1		
12	OFCable 12F Armoured Fiber Optic Cable 12 Core Single Mode Shielded		Mtr	4050		
13	Cable Tie 8 mm	8 mm	Packet	3		
14	Tag Tie		Packet	1		
15	HDPE 1"		Mtr	4050		
16	Flexible Pipe		Bundle	1		
	Sub Total (A)					

(B) Services BOQ

S. No	Product	Unit	Qty.	Unit Price incl. GST	Total Price
1	Laying new fiber cables.	Mtr	3900		
2	Laying of HDPE Pipe	Mtr	3900		
3	Digging Depth 1 Meter new fiber cables.	Mtr	1000		
4	Tracing the old fiber cables and numbering them accordingly. (OTDR testing)	Core	500		
5	Fiber Splicing Per core	Core	500		
6	Mounting the network racks.	No	12		
7	Mounting the network switches.	No	11		
8	Configuring the network switches and devices.	No	11		
9	Rack Dressing / Patching / Numbering	No	12		
10	Project Management/ Documentation/ Consultancy	Onetime	1		
11	Existing Network Optimization as per NATRAX requirement	Onetime	1		
	Subtotal B				
	Grand Total (A+B)				

Seal & Signature of Bidder