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Revised RFP for Selection of Project Implementing Agency For Implementation Of ABP(Amended BharatNet Program) in Gujarat under GFGNL (Design, Construction, Supply, Implementation, Testing & Commissioning and Operation & Management Model)

(Tender No. GFGNL/GFG/e -file/263/2026/0070/Phase-III(ABP in

Gujarat Fibre Grid Network Limited (GFGNL)

A Government of Gujarat Company

Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010

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i) DISCLAIMER

The information contained in this Request for Proposal (RFP) document or subsequently provided to Bidder(s), whether verbally or in documentary or any other form by or on behalf of the Gujarat Fibre Grid Network Limited (GFGNL) or any of their employees or consultants, is provided to Bidder(s) on the terms and conditions set out in this RFP and such other terms and conditions subject to which such information is provided.

The purpose of this RFP is to provide interested parties with information that may be useful to them in eliciting their financial offers (the "Proposal") pursuant to this RFP. This RFP includes statements, which reflect various assumptions and assessments arrived at by the TENDERER, in relation to the RFP. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. This RFP may not be appropriate for all persons, and it is not possible for the TENDERER, its employees, or Consultants to consider the investment objectives, financial situation and particular need of each party who reads or uses this RFP. The assumptions, assessments, statements and information contained in this RFP, may not be complete, accurate, adequate or correct. Each Bidder should, therefore, conduct its own surveys and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this RFP and obtain independent advice from appropriate sources before filling up the Bid. Any deviation in the specification or proposed solutions will be deemed as incapability of the respective Agency and shall not be considered for final evaluation process.

Information provided in this document to the Bidder(s) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The TENDERER accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

TENDERER- its employees and advisors make no representation or warranty and shall have no liability to any person, including any Applicant or Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, adequacy, correctness, completeness, delay or reliability of the RFP and any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way during the Bidding process.

ii) ABBREVIATIONS

Sr. no.	Abbreviations	Description
1	AAA	Authentication, Authorization, and Accounting
2	ABD	As Build Diagram
3	ADSS	All-Dielectric Self-Supporting
4	AES	Advanced Encryption Standard
5	AMC	Annual Maintenance Contract
6	API	Application Programming Interface
7	BA	BA Business Area
8	BCP	Business Continuity Plan
9	BEG	Business Exchange Gateway
10	BIS	Bureau of Indian Standards
11	BNG	Broadband Network Gateway
12	BOM	Bill of Material
13	CC	Cable Chamber
14	CD-ROM	Compact Disc Read-Only Memory
15	CGST	Central Goods and Services Tax
16	EMD	Earnest Money Deposit
17	EMS	Element Management System
18	FAT	Final Acceptance Testing
19	ICT	Information and Communication Technology
20	IE	Independent Engineer
21	IEM	Independent External Monitor
22	IP	Internet Protocol
23	IP-1	Infrastructure Provider Category 1
24	IPS	Intrusion Prevention System
25	ISO	International Organization for Standardization
26	IT	Information Technology
27	KPI	Key Performance Indicator
28	LAN	Local Area Network
29	LoA	Letter of Award
30	LoI	Letter of Intimation
31	Mbps	Megabits per second
32	MPLS	Multi-Protocol Label Switching
33	MSP	Managed Service Provider
34	MS Pole	Mild Steel Pole
35	MTCTE	Mandatory Testing and Certification of Telecom Equipment

Sr. no.	Abbreviations	Description
36	NMS	Network Management System
37	NOC	Network Operations Centre
38	NSP	Network Service Provider
39	OEM	Original Equipment Manufacturer
30	OFC	Optical Fiber Cable
41	OS	Operating System
42	PAC	Precision Air Conditioning
43	PAT	Partial Acceptance Testing
44	PBG	Performance Bank Guarantee
45	SDC	State Data Centre
46	PoP	Point of Presence
47	RFP	Request for Proposal
48	RFMS	Remote Fiber Monitoring System
49	RFTS	Remote Fiber Test System
50	RTGS	Real-time gross settlement
51	R-NOC	Remote – Network Operations Centre
52	SLA	Service Level Agreement
53	SPOC	Single Point of Contact
54	SWAN	SWAN State-Wide Area Network
55	TDS	Tax Deducted at Source
56	TE / T.E.	Tender Enquiry
57	TEC	Telecom Engineering Center
58	TSEC	Technical Specification Evaluation Centre
59	UBR	Unlicensed Band Radio
60	UPS	Uninterruptible Power Supply
61	VC	Video Conferencing
62	VLAN	Virtual LAN
63	VoIP	Voice over Internet Protocol
64	VPN	Virtual Private Network
65	VSAT	Very Small Aperture Terminal
66	WAN	Wide Area Network
67	SIA	State Implementation Agency (GFGNL)

iii) DEFINATIONS

Sr. No.	Abbreviation/ Term	Description
1	Acceptance of Letter of award (LoA)	The date on which the successful bidder(s) accepts the letter of award issued by Purchaser.
2	AWO	Advance Purchase Order/Advance work order" or “Letter of Intent” means the intention of GFGNL to place the Purchase Order/ work order on the successful bidder
3	~~APO~~ Appointed Date	“Appointed Date” means the date of signing of Agreement by the successful bidder after acceptance of APO and submission of Performance Security by the successful bidder.
4	Bidder	The Company, who participates in this tender and submits its bid. In case of Consortium Bids, the Bidder will mean Lead bidder as well as Consortium Partner/s, if not otherwise specified.
5	Business Hours	The prime utilization period, which shall be starting from 10:30 hrs. till 18:10 hrs. on all working days or as defined by the Purchaser from time to time, unless the specific context requires otherwise. These Business Hours shall be applicable only to GFGNL office operations on all working days.
6	Amended BharatNet Program	Bharatnet Phase-3
7	Contract Price	The price payable to the Contractor under the purchase order/work order for the full and proper performance of its contractual obligations
8	Deliverables	The products, infrastructure, and services to be delivered by the successful bidder in the RFP and Contract, and as proposed in the Proposal and all related documentation/designs/policies and guidelines.
9	End-of-Life	End-of-life is the date of End-of-Sale and/or End-of Support (whichever is earlier) given by the OEM/ on its website or through any public announcement. End-of-Life would be indicating that a product is in the end of its useful lifetime and on the specified dates the vendor will no longer be marketing, selling, or sustaining a particular product and may also be limiting or ending support for the product.
10	End-of-Sale	The date indicated by the OEM on its website or through any public announcement, after which the OEM/ stops marketing or selling the product.
11	End-of-Support	Is with reference to a product and is the date indicated by the OEM/distributor on its website or through any public announcement, till

Sr. No.	Abbreviation/ Term	Description
		which the OEM/distributor will provide service/updates/patches/spare parts/technical support service.
12	FAT	Final Acceptance Testing to test the successful implementation of the scope of work specified in the RFP. Final Acceptance Test or Acceptance Testing carried out by the Independent Engineer (IE)/ GFGNL after successful completion of the PAT (Preliminary Acceptance Test) by PIA as per Acceptance Testing template duly approved by GFGNL
13	Fixed Scope	Means the scope of work to be done by the SP as part of the RFP.
14	Firm Work Order (FWO)	Firm work order means the individual work order under contract which will be issued to the contractor by GFGNL or his authorized representative on behalf of DBN after the survey report and BOQ approved by GFGNL. However, the flexibility shall remain with respective GFGNL or his representative to further decide about the quantum of work in each firm order as per the local conditions. Accordingly, payment will be made for the works executed, goods supplied or/and services rendered based on the firm work order.
15	Purchase Order/ work order	The order placed by GFGNL on the PIA signed by GFGNL on behalf of DBN, DoT including all attachments and appendices thereto and all documents incorporated by reference therein.
16	Independent Engineer	A third-Party Agency appointed by GFGNL for the acceptance testing/ inspection of works, bill verification, dispute resolution etc.
17	Project Implementation Agency (PIA)/ Contractor	The Company or Consortium of companies executing the works under the contract. The bidder will become PIA after acceptance of A.P.O.
18	Go-Live	The date of commencement of work and acknowledged by end customer (IE/GFGNL). If block level atleast 90% of GP live in ring then it will be considered as block 100% go-live.(* aggregate count of GP at Sub-Block will be considered at once for the cases of dual home network architecture,i.e., the other side of block GP ring will not be considered)
19	MSP/Managed Service Partner	Managed Services Provider is the company who optimize your communications infrastructure to minimize downtime and remediate problems on your behalf.
20	Master Block	Any co-located sub-block in which multiple sub-block rings are parented

Sr. No.	Abbreviation/ Term	Description
21	Original Equipment Manufacturer (OEM)	Manufacturer of any equipment/system/software/product/services who is providing such goods services to the Purchaser's requirement(s).
22	Parties	The Purchaser and the Service Partner collectively, for the purposes of this Contract and "Party" shall be interpreted accordingly to the context therein.
23	State Data Centre (SDC)/S-NOC	State Data Centre (SDC means a Data Center located at Gandhinagar / S-NOC that would house the Information and Communication Technology (ICT) equipment required for carrying out centralized operations of the BharatNet.
24	Project	The activities to be performed by the Service Partner regarding this RFP
25	Purchaser	Purchaser Means GFGNL or any other government agency
26	Requirements	All the documents prepared by the Purchaser about the Project, Scope of Work, SLA, schedules, details, description(s), statements of technical data, performance characteristics and standards (Indian & International) as applicable and specified in the RFP
27	RFP	The Request for Proposal bearing reference no: *GFGNL/GFG/e -file/263/2025/0006/Phase-III(ABP in Gujarat)* and any other documents/formats provided along with this RFP or issued during the selection of successful bidder(s), corrigenda, seeking a set of solution(s), services(s), materials and/or any combination of them.
28	Service Level	The level of Service and other performance criteria which will apply to the Services delivered by the Service Partner.
29	Service Level Agreement	Service Level Agreement (SLA) is an agreement, to be signed between the successful bidder and the Purchaser includes all attachments, appendices, all documents incorporated by reference thereto together with any subsequent modifications, the RFP, the bid offer, the acceptance and all related correspondence, clarifications, presentations for the level of service and other performance criteria which will apply to the services delivered by the Service Partner.
30	Scope of Work/ SoW	To be performed by the Service Partner as provided in RFP and as arising from other clauses of the RFP and includes the requirements and deliverables of the project.
31	Special sites	Special sites are those sites which are to be included for purpose of External Audit. Physical visits for Audit to these sites are necessary.
32	Office Hours	Working hours of the GFGNL (10:30 AM to 6:10 PM) on all Working days

Sr. No.	Abbreviation/ Term	Description
33	Day	Day means both working as well as non-working day, unless specified otherwise
34	POP	Point of Presence is any location from where connectivity can be extended.
35	RKM	Total Fibre(not optical core) Running Kilometers
36	Dual homes	Dual homes clarifies as GP node/ring is parenting to two different sub-block equipment physically and logically both. Simillary, Sub-Block node/ring is parenting to two different Master-Block equipment physically and logically both.
37	Telecom Service Provider	"Telecom Service Provider " means any Telecom operator in India, who is licensed by the Department of Telecommunications (DOT), Government of India to provide telecom services to the general public or to the other DOT licensed Telecom operators. "Telecom Service Provider" also refers to any Telecom operator in other countries providing telecom services to general public of that country or to other telecom operators of the same country.
38	Works	All the equipment, machinery, and/ or other materials and services which the PIA requires to deliver towards fulfilment of scope of work under this Tender.
39	Unified Network	Integration of combined network of BharatNet Phase-I, BharatNet Phase-II (including GoI infrastructure) and BharatNet Phase-III for GFGNL.

iv) STRUCTURE OF THE RFP

Tenderer desires to select the ~~Service Provider~~ Project Implementing Agency (PIA) for RFP for Selection of Project Implementing Agency For BharatNet Phase-III Project in Gujarat under GFGNL (Design, Construction, Supply, Implementation, Testing & Commissioning and Operation & Management Model). In this respect, Tenderer is undertaking a comprehensive Tendering process to select the most-suitable ~~service Provider~~ PIA via competitive Bidding. This RFP is meant to invite proposals from the interested bidders capable of delivering the services described herein. Details of the same are given in following sections:

Section	Description
Section I	KEY INFORMATION & INSTRUCTIONS
Section II	INTRODUCTION
Section III	ELIGIBILITY CRITERIA
Section IV	INSTRUCTIONS TO BIDDERS
Section V	SCOPE OF WORK
Section VI	PROJECT TIMELINES
Section VII	SERVICE LEVEL AGREEMENT (SLA) & PENALTY
Section VIII	FINANCIAL BID
Section IX	ANNEXURES & FORMATS
Section X	SPECIAL TECHNICAL CONDITIONS (TECHNICAL SPECIFICATIONS)

v) FACT SHEET

The following table provides information regarding the important dates of the bid process:

#	Particular	Details
1.	RFP Inviting Authority	Gujarat Fibre Grid Network Limited (GFGNL)
2.	Job Requirement	Revised RFP for Selection of Project Implementing Agency For Bharatnet Phase-III Project in Gujarat under GFGNL(Re-Tender)
3.	Date of Publication	04/06/2026
4.	Availability of RFP Document	The RFP document can be obtained from website https://bharatnet.gujarat.gov.in/home,https://tender.nprocure.com/
5.	Name and address for communication and seeking clarification regarding the RFP	Chief Finance Officer (CFO) Gujarat Fibre Grid Network Limited (GFGNL), Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar -382010 email id: bid1gfgnl@bharatnet.gujarat.gov.in, bid2gfgnl@bharatnet.gujarat.gov.in, pmc@bharatnet.gujarat.gov.in, pmc2@bharatnet.gujarat.gov.in ,pmc3@bharatnet.gujarat.gov.in,
6.	Last date for receiving queries/clarifications	The last date of submission of pre-bid queries shall be 18/06/ 2026 at 11: 55.pm. All the pre-bid queries should be received on or before the prescribed date and time, through only official email id with subject line as: Pre-bid queries < Bidder's name> The queries should be submitted in an .xls Format as per the format prescribed in RFP document.
7.	Time, Date and Venue of Pre-Bid Conference	18/06/2026 at 03:00 pm ~~At Department of Science and Technology, Government of Gujarat/Gujarat Fibre Grid Network Limited (GFGNL)~~ ~~Conformance Hall, Block No. 7,~~ ~~5th Floor, New Sachivalaya, Gandhinagar-382010~~ At CR-1, Block No. 1, 4th Floor, New Sachivalaya, Gandhinagar-382010 Note: As the new venue is within the sachivalaya (Secretariat offices) premises, an entry pass may be required. We kindly request you to arrive well in advance of the scheduled pre-bid meeting time to facilitate the necessary arrangements of obtaining the entry pass
8.	Date of response to Bidder Queries	Within 15 days from the date of pre-bid conference. ***Note:*** *The Purchaser shall not be obligated to respond to any or all the queries. The Purchaser may, at its sole discretion, choose to publish responses to the pre-bid queries and /or any corrigendum on Central Public Procurement portal*

#	Particular	Details
		https://gfgnltender.nprocure.com/ *or may send through email or any other means.*
9.	Last date for submission of Bid/proposal	~~02/07/2026~~ ~~16/07/2026~~ ~~30/07/2026~~ ~~14/08/2026~~ ~~18/08/2026~~ ~~25/08/2026~~ ~~27/08/2026~~ 05/09/2026 at 06:10 pm
10.	Last date for submission of Bid/proposal (Physical copy excluding financial bid only if asked based on nature of RFP) i) Tender Fee ii) EMD iii) PoA(Power of Attorney) iv) Integrity Pact	Within 5 working days from the Date of submission of online bid dates in working hours (till 06:10pm) Address: Chief Finance Officer(CFO), Gujarat Fibre Grid Network Limited Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010 In event of particular ask of submitting physical copy then logical portion of the bid should be appropriate in the respective sealed cover for maintaining confidentiality.
11.	Bid Processing fee payable	Bidders shall submit, along with their bid, non-refundable bid processing fee of Rs. 15K/- +GST 18% Extra (Fifteen Thousands Rupees -- only+ GST 18%extra) in the form of a DD / on any nationalized bank payable in favor of "Gujarat Fibre Grid Network Limited" Name of the Beneficiary: Gujarat Fibre Grid Network Limited Bank Name: State Bank of India Bank Account Number: 36242993620 IFSC Code: SBIN0060228 Branch Name: Udyog Bhavan Branch, Gandhinagar Name of the Beneficiary: Gujarat Fibre Grid Network Limited
12.	Bid Security/ Earnest Money Deposit (EMD) Amount Payable	Rs. 50 Cr (Rupees Fifty Crore only) **Details of the Bank:** Name of the Beneficiary: Gujarat Fibre Grid Network Limited Bank Name: State Bank of India Bank Account Number: 36242993620 IFSC Code: SBIN0060228 Branch Name: Udyog Bhavan Branch, Gandhinagar Name of the Beneficiary: Gujarat Fibre Grid Network Limited **Note:** i) As per the GoG guideline, EMD should be in the form of BG as per the GoG GR No. FD/MSM/e-file/4/2023/4020/D.M.O dated 11-03-2024 or latest regarding the Acceptance of Bank Guarantee as SD and EMD. ii) DD/Payorders are not accepted as EMD. iii) EMD and Bid validity period shall consider as 180 days from last date of bid submission with claim period of over and above 45 days. In case of price validity beyond claim period, bidder need to submit BG with extendable period for price validity including claim period

#	Particular	Details
13.	Address at which bids are to be submitted	Proposal shall be uploaded online in the format and mode as provided for in the Portal https://tender.nprocure.com/ for this RFP in the system and shall be digitally signed by the authorized signatory of the Bidder.
14.	Opening of Qualification Bids	To be announced later
15.	Opening of Technical Bids	To be announced later
16.	~~Technical Presentation~~	~~To be announced later~~
17.	Method of Selection (Define)	L1 Based selection
18.	Date for the opening of financial bid for technically qualified bidders	To be announced later
19.	Contract Duration	10 Years (3 Years of Implementation (As per Project timeline section), 10 Years of Operation and Maintenance) from the date of assigning workorder (i.e., The scope includes Operation and Maintenance (O&M) of the existing network from Day One, along with the implementation of the initial IP-MPLS ring connectivity project and subsequent O&M of the newly created network. Furthermore, based on performance and requirements specified in the tender, the contract may be considered for extension. Bidders are advised to refer to Clause 4.53(II) for provisions related to extension beyond the initial 10-year period.)
20.	Performance Bank Guarantee	i) 5 % of CAPEX, ii) 5% of OPEX (Existing O&M) and iii) 5% of OPEX (Entire Phase - III)

Note: The above date, time and venue may be altered by GFGNL at its Sole discretion after giving prior notice to the Bidders, some of the information provided in the above Fact sheet is further elaborated in the subsequent sections of this RFP and the information provided in the sections of this RFP are to be read in conjunction and are to be interpreted harmoniously.

SECTION-1 KEY INFORMATION & INSTRUCTIONS

1.1 INFORMATION REGARDING RFP

a) Proposal in the form of the BID is requested for the item(s) in complete accordance with the documents/attachments as per following guidelines.
b) Bidder shall upload their bids on eProc-Suite (https://gfgnltender.nprocure.com)
c) The Bid Security in the form of EMD in a sealed envelope super scribed with the bid document number to GFGNL office.
d) Bids complete in all respects should be uploaded on or before the BID DUE DATE.
e) Technical Bids will be opened in the presence of Bidders' representatives who choose to attend on the specified date and time.
f) In the event of the date specified for receipt and opening of bid being declared as a holiday for GFGNL office, the due date for submission of bids and opening of bids will be the next working day at the appointed time.
g) Services offered should be strictly as per requirements mentioned in this Bid document.
h) Please spell out any unavoidable deviations, Clause/ Article-wise in your bid under the heading Deviations and Bidder has to clarify with tenderer in pre-bid and in post corrigendum's.
i) EMD and Bid validity period shall consider as 180 days from last date of bid submission with claim period of over and above 45 days. In case of price validity beyond claim period, bidder need to submit BG with extendable period for price validity including claim period.

1.2 INSTRUCTION TO THE BIDDERS FOR ONLINE BID SUBMISSION

i. Tender documents are available only in electronic format which Bidders can download free of cost from the website https://bharatnet.gujarat.gov.in/ and (https://gfgnltender.nprocure.com)
ii. The bids have been invited through e-tendering route, i.e., the eligibility criteria, technical and financial stages shall be submitted online on the website (https://gfgnltender.nprocure.com)
iii. Bidders who wish to participate in this bid, will have to register on (https://gfgnltender.nprocure.com), such Bidders will have to procure Digital Certificate as per Information Technology Act 2000 using which they can Sign their electronic bids. Bidders can procure the same from (n) code solutions – a division of GNFC Ltd., or any other licensed by Controller of Certifying Authority, Govt. of India. Bidders who already have a valid Digital Certificate need not procure a new Digital Certificate.
iv. Interested and eligible Bidders are required to upload the eligibility related document in eligibility bid section, Technical related document in technical bid section & Commercial Bid in Commercial bid section. The Bids should be accompanied by a bid security (EMD) as specified in this tender document. The Technical & Commercial Bid must be uploaded to https://gfgnltender.nprocure.com & the Bid Security must be delivered to the office of Gujarat Fibre Grid Network Limited on or before the last date and time of submission of the bid.
v. The eligibility section and the Bid Security section will be opened on the specified date & time in presence of the Bidders or their authorized representative who choose to attend. In the event of the date specified for bid receipt and opening being declared as a holiday for the office of Gujarat Fibre Grid Network Limited the due date for submission and opening of bids will be the following working day at the scheduled times.

SECTION-2 INTRODUCTION

2.1 BHARATNET PROJECT BACKGROUND

BharatNet is a project funded by Digital Bharat Nidhi(DBN), Department of Telecommunications (DoT), with an aim to provide high speed broadband connectivity to all inhabited Gram Panchayats (GPs), Villages across India. The network infrastructure under this project shall be a national asset and accessible on a non-discriminatory basis to all eligible service providers to enable them to provide services in rural areas.

Following are a few enablers for BharatNet Program,

a) A World Bank study has estimated that a 10% increase in broadband connectivity leads to 1.38% increase in Gross Domestic Product (GDP). Broadband penetration in India at present is less than 2%.

b) Broadband is a tool for improving the lives of people by providing affordable and equitable access to information and knowledge. For individuals, broadband has direct impact on their day-to-day lifestyle. It can contribute towards increased trade and employment avenues.

c) Information and communication Technologies (ICT) applications such as e-Commerce, e-Banking, e-Governance, e-Education and Tele-medicine require high speed Internet connectivity.

2.1.1 BHARATNET PHASE I – PROJECT BACKGROUND

a) BharatNet, led by Bharat Broadband Network Limited (BBNL), is a broadband network that provides broadband connectivity across the country to 2.5 lakh GramPanchayats (GPs), which are the primary nodes for information collection and dissemination, as well as service delivery points for government services.

b) A phased approach was planned to connect GramPanchayats across India. The Telecom Commission approved a 3 – phase implementation of this project.

c) The first phase envisages providing 1,00,000 GramPanchayats with broadband connectivity by laying OFC(Optical Fibre Cable) lines by March 2017 across the country. This was to be covered by BBNL.

d) The implementation was done under Central Public Sector Units (CPSU) led model by M/s BSNL.

e) Under this implementation model, the network infrastructure was deployed by leveraging BSNL's existing Optical Fibre Cable (OFC) from Block to Fibre Point of Interconnect (FPOI) and laying incremental underground OFC from FPOI to GP location.

f) The network architecture was based on linear topology where GPON based electronics infrastructure was deployed across Block and GP location for middle mile network connectivity.

g) Bharatnet Phase – I is a multi-stakeholder project, with a number of organizations including the Department of Telecommunications, the Ministry of Electronics and Information Technology, BBNL, BSNL, RailTel, PGCIL, C-DOT, TCIL and NIC collaborating to ensure that broadband connectivity reaches every Gram Panchayat, enabling adoption by the public and private institutional users as well as the citizens.

h) The ability to access broadband-enabled services provides opportunities to empower digitally marginalized rural citizens; changing the way they learn, communicate, and manage their livelihoods and access health, financial, and government services.

Gujarat Phase-I

Number Of Districts	11
Number Of Blocks	119
Number Of GPs	6761
Executive Agency	BSNL (M/s RAILTEL)

Table:01 Gujarat Phase-I

2.1.1.1 METHODOLOGY OF EXECUTING BHARATNET PHASE I PROJECT

The following fundamental principles were considered while designing the Network.

1. BSNL's backbone Network was used to carry traffic from block level to BSNL Exchange State SDC (State Data Centre).
2. At the block level, BSNL's exchanges were used to install OLTs (Optical Line Terminals).
3. For GPON (Gigabit Passive Optical Network) - a type of point-to-multipoint network technology that delivers broadband access to the end user via fibre optic cable -from OLT to ONT (i.e from block level to GP), 1 / 2 fibre cores were taken on lease from BSNL & RailTel from BSNL exchange / OLT location to FPOI (Fibre Point of Interconnect) location to reduce the quantum of new fibre roll-out.(From OLT to BSNL POI by using existing BSNL & Railtel Fibres)
4. Only incremental/new fibre was planned from FPOI location to GP location.

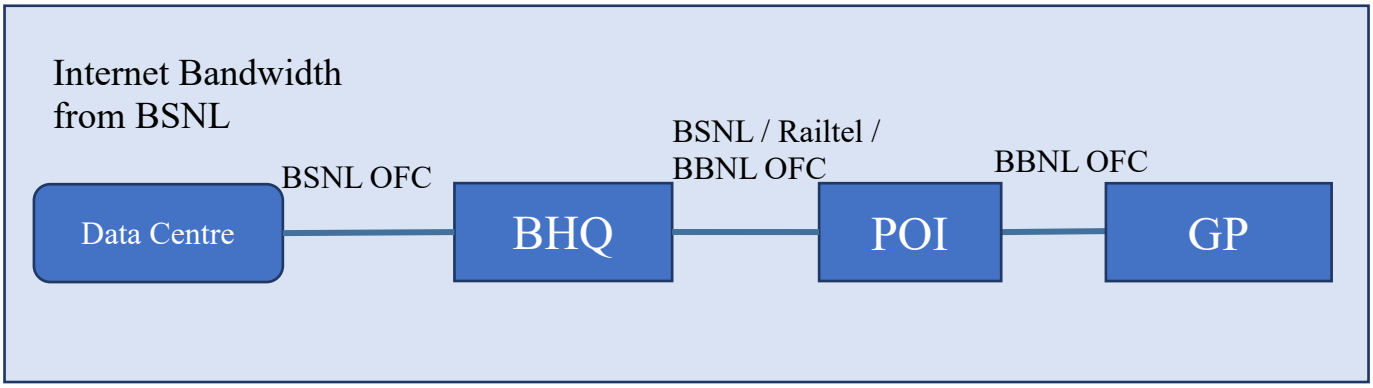


Diagram -01 Phase-I Methodology

5. To Summarize, The BharatNet network implemented in Phase- I consists of using BSNL's existing fibre (on lease) from Block to Fibre POI and laying of incremental OFC (24 core) from Fibre POI to GPs. As part of upgradation in the project of Amended Bhartnet Program (ABP), the PIA shall lay additional OFC for connecting Block to GPs in a ring architecture using the existing incremental BharatNet OFC from Fibre POI to GPs. After the PIA upgrades this network in ring architecture from Block to GPs, integrating the incremental OFC from Fibre POI to GPs, the BSNL's existing leased fibre shall no more be part of upgraded ring architecture.

2.1.2 BHARATNET PHASE II – PROJECT BACKGROUND

a) The central government had approved a modified strategy to overcome the shortcoming experience during Phase-I project execution and approved the implementation methodology of BharatNet Phase-II to connect remaining GramPanchayats with state of art network designing with enhance bandwidth to achieve the vision of Digital India.

b) The Government of Gujarat has set up an Special Purpose Vehicle (SPV) namely "Gujarat Fibre Grid Network Limited (GFGNL)" to implement Phase-II of BharatNet Project in Gujarat. This SPV has been created to synergize with the efforts of the Government of India under the Digital India initiative.

c) These focused efforts are to actualize a state-to-village fibre grid, to facilitate common Government-owned infrastructure, and to provide internet facilities to residents of Gujarat state.

d) The connectivity is already done by laying end to end (GFGNL owned) OFC from Block to GPs location.

e) The network architecture is based on linear topology at last mile where GPON based electronics infrastructure was deployed across Block and GP location for network mid-haul connectivity.

f) GFGNL has already connected around 8037 locations mainly comprising Gram Panchayat (GP) along with TC/DC/GIDC etc. GFGNL also started extending BharatNet connectivity from respective Gram Panchayat (GP) to various offices/Locations of GoG at the village level.

g) GFGNL has implemented BharatNet Phase – II network in Gujarat in two different packages. Package – A has three islands in Rest of Gujarat and Package – B has one island in Saurashtra region. Package – A has 12 districts (Now as new district developed from existing Banaskhantha district, total 13 district in package-A) & Package – B has 10 districts. Further, both the packages are divided into two zones. Package A has two zones i.e., Vadodara zone & Surat zone and Package B has two zones i.e., Ahmedabad zone & Rajkot zone.

h) Bidders are also requested to get the technical information about the network implemented by GFGNL by referring to the RFP (*Request for Proposal for Selection of Project Implementing Agency for BharatNet Phase-II project in the State of Gujarat under Gujarat Fibre Grid Network Limited*). (Reference: *https://bharatnet.gujarat.gov.in/tenders*)

i) GFGNL's Network comprises of the various technology equipment including GPON(OLT-ONT), DWDM, OTN, LA-Line Amplifier, RFMS etc.

j) GFGNL has already installed telecom grade shelters and completed the shifting of the OLT and other transport devices from BSNL exchange to approximate 383 shelters.

k) High-level existing network topology is as below,

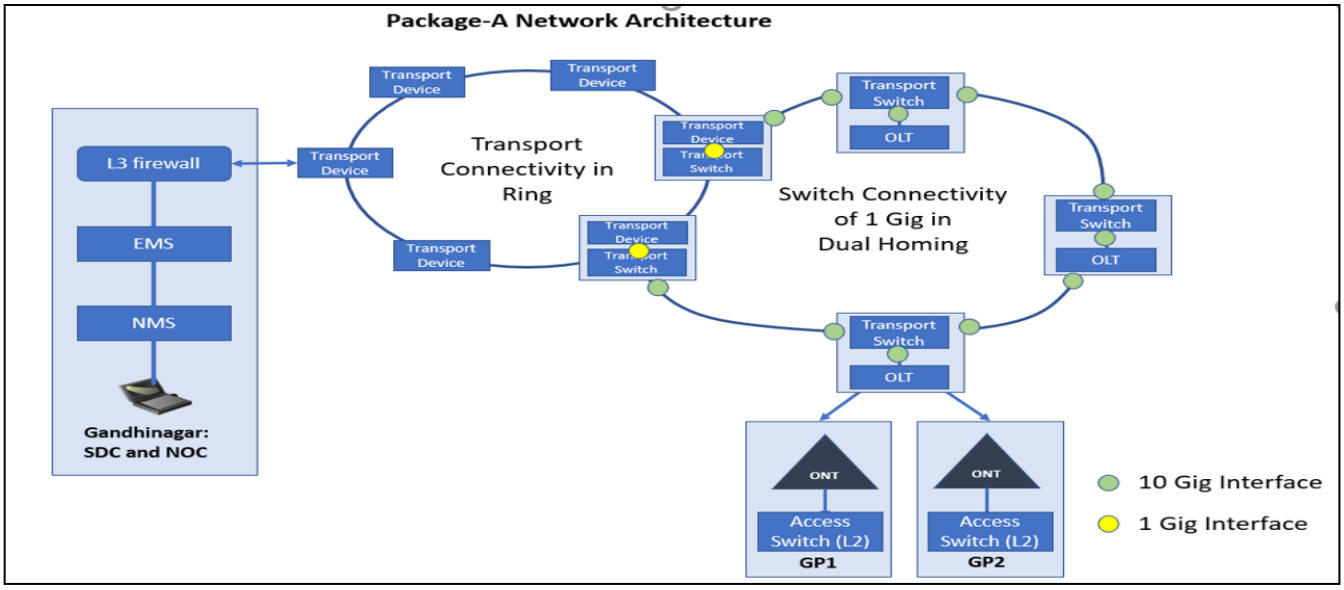


Diagram -02 (Phase-II Package-A Network Architecture)

Note: 20 GP (Gram Panchayat) connected from 1 OLT (Optical Line Terminal) with 2 GP per PON (Passive Optical Network) Port of OLT, However, in OLT approximately 25-27 GPs Connected .

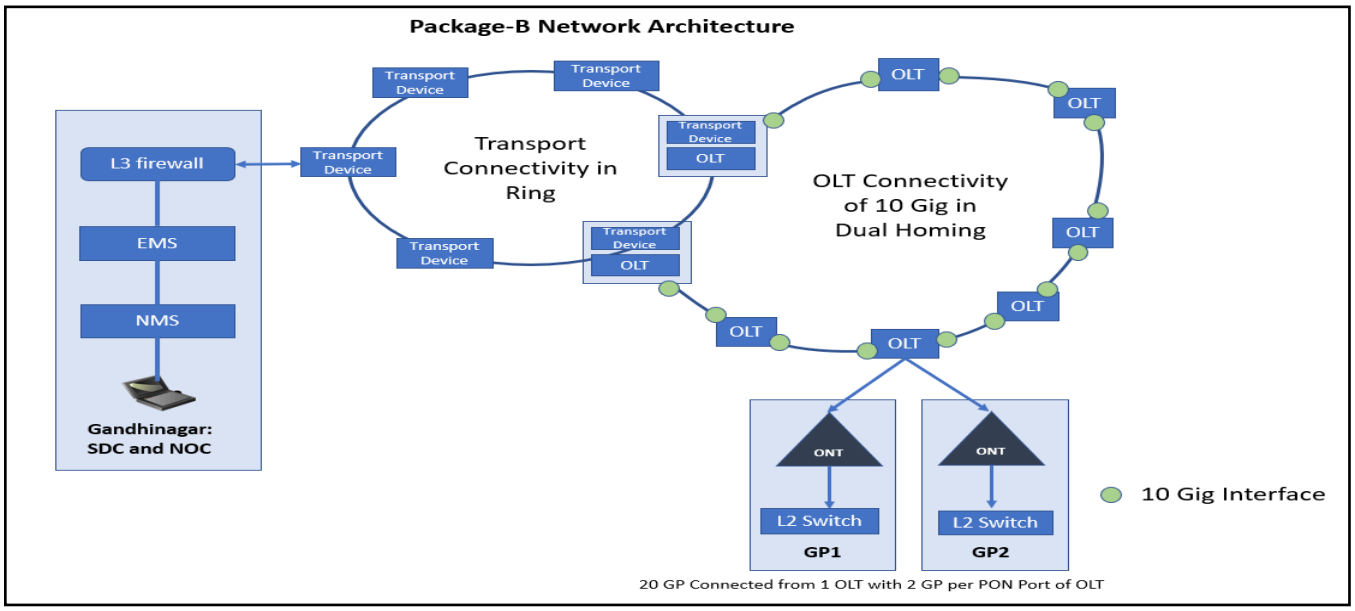


Diagram -03 (Phase-II Package-B Network Architecture)

In a present network, physical connectivity between 2 layers of transport mux and transport switch/OLT is as per below in both packages.

Package - A: Uplink 10G port of each OLT is connected to 10G port of transport switch. Generally, 4 or 5 transport switches are connected in a ring with 10G uplink ports and dual homed on 1G dropping ports of transport mux on both sides.

Package - B: Generally, 8 to 16 OLTs are connected in a ring with 10G uplink ports and dual homed on 10G dropping ports of transport mux on both sides.

2.2 OBJECTIVE OF BHARATNET PHASE III

I. The 'Amended BharatNet Phase-III Program' in Gujarat, commanded by Gujarat Fibre Grid Network Limited (GFGNL), is a transformative initiative aimed at revolutionizing rural connectivity and strengthening digital inclusivity. This comprehensive project encompasses the integration, expansion, and technological upgrade of BharatNet Phase-I and Phase-II networks, laying the foundation for a robust broadband infrastructure. The project endeavors to connect approx. additional ~4,400 more villages over and above the existing rural connectivity, empowering rural communities through enhanced digital services. Leveraging IP-MPLS technology, ring topology, and strategic network design, the upgraded BharatNet Network is poised to bridge the digital divide, drive socio-economic development, and propel Gujarat into a new era of digital empowerment.

II. The 'BharatNet Phase-III Program' in Gujarat is a transformative initiative aimed at bolstering digital infrastructure and digital connectivity throughout the state. The project's comprehensive approach, covering rural areas, is aligned with the national agenda of Digital India, fostering economic development, technological upgradation, and improved operational efficiency.

III. The project seeks to create a seamless and unified digital network across the entire state of Gujarat by integrating and optimizing the infrastructure developed under BharatNet Phase I and Phase II initiatives.

A) Project Objectives with Strategic Goals

The objectives reflect the project's commitment to providing digital services in equitable manner and contributing to the overall development of the state. The primary objectives of the project are outlined to underscore its strategic goals, which includes:

I. **Comprehensive Integration:** Seamlessly integrate BharatNet Phase-I and Phase-II networks to establish a unified and cohesive digital infrastructure equitable across the state.

II. **Technological Upgrade:** Implement IP-MPLS technology for better accessibility/service-offering and ring topology for better network reliability.

III. **Expanded Connectivity**: Reaching approximately 4400 more villages over and above the existing rural connectivity, to cover full landscape of Gujarat and a step towards everyone's right to take part in digital journey.

IV. **Network scalability:** Future traffic demand to be supported with network scalability as per the device specification mentioned in technical specification section, considered with 1G to 10G at GP level and 10G to 100G at Block Level.

V. **Ensuring better customer service:** Single NOC for the entire network along with 24 x 7 helpdesk support to ensure quality service delivery.

VI. **Ensuring operational efficiency:** High network availability to be maintained up to 98% by additional OFC to be laid with appropriate (24F/48F/96F) Armored cable, UPS deployment with minimum 6 Hrs backup at each GP.

VII. **Socio-Economic Empowerment:** Facilitate digital empowerment by enabling access to education, healthcare, e-governance, and economic opportunities in rural areas. Deployment of mini-OLT at each GP with target of approx. 9 lakhs customer over BharatNet network.

VIII. **Stakeholder Collaboration:** Foster collaboration among GFGNL, the Government of Gujarat, Department of Telecommunication (DoT) and other stakeholders to ensure seamless execution and alignment with national broadband connectivity goals.

IX. **Network Availability**: KPIs (Key performance Indicators) are considered in BharatNet Phase-III (Amended BharatNet Program) for State NOC equipment >=99.9% , for Sub/Master-Block level router >=99.5% and for GP level router >=98.5% in view of achieving high network availability.

B) Effective Fiberization:

Fulfilment of compliances of amended BharatNet guidelines using concentrative purpose of 'Effective Fiberization (5-E and 6-F)' across the rural landscape of Gujarat which is to be kept in consideration for organic growth of Network and Business revenue streams by having unique element of **Omni presence in unreachable areas to meet first and foremost purpose of DIGITAL BHARAT NIDHI(DBN).**

'Effective':5-E dimensions

1. Extend the network footprint for equitable coverage.
2. Expand the network service basket for unlocking revenue streams through dark fiber for Telco & digital enterprise, Internet peering service, wireless broadband, Govt Network (SWAN), Enterprise VPN, Community Wi-Fi to meet long term financial sustenance.
3. Enhance availability by optimum redundancy in the network paths.
4. Economize through scale and lessor expenses on last mile through enroute locations for affordability to onboard lower strata of rural masses and
5. End-to-end seamless flow of bits from state capital upto villages including Internet breakout points for effective Internet/Intranet both with Omni presence proposition.

'Fiberization':6-F dimensions

1. Fibre to Far flung areas
2. Fibre to Family
3. Fibre to Field offices of Government
4. Fibre to Farm
5. Fibre to Financial market and
6. Fibre to Fraternity (Social Inclusion)

The first and foremost objective for attaining business momentum is to target following entities and provide them conducive, cooperative, competitive footprint and cost effective statewide one stop services:

I. Government segment: E-Governance, Rural schools (Govt and private), Agriculture, Animal husbandry, Community health, Anganwadi, Food and civil supplies, public community Wi-Fi at Panchayat
II. Telco segment: Fibre for TSP, Broadband local ISP
III. Power segment: Electricity distribution, utilities, and solar companies
IV. Financial market: Cooperative banks, Private banks, non-banking finance companies and Insurance, Stock exchange intermediaries
V. Agriculture: Fertilizer shops, Seeds and pesticides retail chains, Agriculture mandis, APMC, Commodity traders, IoT
VI. Education: Digital aided learning centers, Private schools, Libraries, Hostels
VII. Business enterprises: Logistics and transport, Retail chain, Hotel chain, Digitization anywhere, Remote factories
VIII. New emerging rural opportunities: Open Network for Data Commerce (ONDC), rural e-Commerce, Rural ATMs, Rural IoT

C) Approach to achieve the objectives.

With the envisage objective of digitization, the approach is bifurcated in below three major categories.
Part – I: Acquisition and upgradation of BharatNet Phase-I network along with integration to Phase-II Network and Operation & Maintenance of existing Phase-I and II BharatNet network.
Part – II: To upgrade BharatNet Phase –I and II Network with IP – MPLS technology and Operation & Maintenance of existing Phase-I and II BharatNet.
Part – III: Connectivity to balance ~4400 villages of Gujarat on demand.

SECTION-3 ELIGIBILITY CRITERIA

3.1 PRE-QUALIFICATION CRITERIA

I. The Bidder may be a single entity or a group of entities (the "Consortium"), coming together to implement the Project. However, any Bidder applying individually or as a member of a Consortium, as the case may be, cannot be member of another Bidder applying for the same. The term Bidder used herein and, in this RFP, would apply to both a single entity and a Consortium.

II. In case of Consortium, the number of bidders including Lead Bidder can be maximum three.

III. The Bidder must attach valid documents in support to their Technical and Financial capabilities/ strength, as mentioned above. Without proper supporting documents, the Bid proposals are liable for rejection.

IV. Following are the common criteria for eligibility for submitting bids in the tender for the purpose of tender evaluation.

#	Description	Minimum Requirement	Documentary Proof
1	Legal Entity	**1.1** The Sole and each of the Consortium members should be an Indian firm. **1.2** The Sole or each of the consortium members(all) including Lead Bidder (in case of consortium) should be registered under the Companies Act 1956/2013 in India or a Limited Liability Partnership Firm under Limited Liability Partnership Firm Act 2008 or as amended at the time of the bidding submission date. **1.3** The Sole or each of the consortium members should have a registered number of, GST, Income Tax / Pan number. **1.4** The Sole and each of the consortium members should be in operation in India for a period of at least 5 years as on publication of this tender.	**a)** Copy of certification of incorporation issued by competent authority/ Registration Certificate **b)** Copy of PAN card **c)** Copy of GST registration
2	Company TurnOver	**2.1** The Sole Bidder and In case of Consortium (combined turnover of lead bidder and Consortium member/s) should have an average annual turnover of at least following values in last three (3) audited financial years ~~FY 2022-23, FY 2023-24, and FY 2024-25 or~~ FY 2023-24, FY 2024-25, and FY 2025-26~~(non-audited may allowed)~~ as per table details mentioned in **Appendix # A** The Sole Bidder and Bidder in case of consortium (Lead and consortium) should be in the business of OFC Business or Telecom or	**2.1** The Sole Bidder and In case of Consortium (lead bidder and Consortium member) For Annual Turnover: **a)** Copy of audited Balance Sheet, audited Profit & Loss statements for each of the last 3 financial years **b)** Copy of Certificate from the statutory auditor / Charted Accountant (CA) clearly specifying the annual turnover for each of the last 3 audited

#	Description	Minimum Requirement	Documentary Proof
		EPC in underground utility (OFC or Power or Pipeline or GAS or other utility). **Note:** **1.** Turnover considered would be a consolidated turnover of the company i.e. A parent Company can use the turnover of its subsidiaries (50% and above holding) but a child company cannot use parent company's turnover. However, both the company should have same domain experience. **2.2 Net Worth:** Minimum Net Worth required for a Bidder shall be positive 470 Cr at the close of the preceding financial year or subsequent to that. **Note:** In case of Consortium, each member of the consortium should have positive Net Worth. All the consortium partners can meet the Net worth criteria cumulatively.	financial years, i.e. ~~FY 2022-23, FY 2023-24, and FY 2024-25 or~~ FY 2023-24, FY 2024-25, and FY 2025-26~~(non-audited may allowed)~~ **c)** Self Certification to be signed by Company Secretary/ Statutory Auditor on company's letter head mentioning the required shareholding. **2.2** For Positive net worth: **a)** Certificate from the Statutory Auditor on net worth ~~i.e., FY 2022-23, FY 2023-24, and FY 2024-25)~~ FY2023-24, 2024-25 & 2025-26). Audited financial statements for the last three financial years (~~2022-23, 2023-24 & 2024-25 or~~ 2023-24, 2024-25 & 2025-26). ~~Unaudited~~ statement if certified by the Statutory Auditor for the year 2025-26, shall also be accepted.
3	Experience	The Sole or lead bidder (in case of consortium) or any one consortium member should have demonstrable experience with following in last 10 Years, as on this bid submission date: i) **For Optical Fibre:** **a)** The ~~Sole or lead bidder (in case of consortium) or any one consortium member/s~~ Bidder should have experience / Technical Capacity of having executed EPC OFC Network Construction project consisting of 24 or more core Under Ground OFC (to be calculated as per formula defined below) in the last 10 years (from bid	The Sole or lead bidder (in case of consortium) or any one consortium member (as per appendix#A) **3.1**Need to submit WO Copy /LOI/LOA/Contract agreement. -In case of consortium, valid documentation/copy with notarized MoU between lead and consortium member/s with roles and responsibilities

#	Description	Minimum Requirement	Documentary Proof
		submission date) within India, for at least as per table details mentioned in **Appendix # A** • The EPC OFC Construction project execution shall consist of both Supply of all material and Construction of OFC Network, i.e., For underground (UG) activities, experience related to individual components such as separate OFC construction activities (e.g., trenching & ducting (T&D), horizontal directional drilling (HDD)), OFC laying, ducts, etc., shall not be considered independently. ~~Only the total executed OFC length (in km) under EPC mode shall be considered for experience evaluation~~ **AND** **b)** For OFC O&M Experience: The bidder should have satisfactorily completed in the last 10 years (from bid submission date) within India, the O&M of any OFC network of 24 or more Core Under Ground OFC [upto 40% of the O&M requirement can also be met through O&M of 24 or more core Aerial Fiber Cables (~~deployed in BharatNet by BBNL or state SPV~~)/ ADSS/ OPGW OFC, as required for EPC Network Construction capability mentioned above in (a), refer the table details mentioned in **Appendix # A** **AND** **ii) For Active Equipment's Experience**: Either Experience of Telecommunication equipment installation, commissioning ~~and~~ Or O&M (or AMC /warranty) as per table details mentioned in **Appendix # A** The active nodes to be considered for this criterion can be, i.e., either all or any one or any of the combination, IP MPLS Routers(other then FTTx/Wi-Fi CPE), Layer-3 Switches, BNGs,	of members with legitimate evidence for claimed experience from client. **For completed projects** (WO copy / contract copy) with any of one document as legitimate evidence for claimed experience from client. i) Successful Go-live Certificate, Or ii) Successful Acceptance Test Report, Or ii) Successful Work completion Certificate **For ongoing projects** (WO copy contract copy) with any one of document as legitimate evidence for claimed experience from client clearly stating total KM of Fibre/number of equipment, i) Successful Go-live Certificate, Or ii) Successful Acceptance Test Report, Or iii) Successful Work Experience Certificate **For OFC O&M Activities :** O&M must be for atleast one (1) year duration for asked Km. (WO copy/ contract copy) with any of one document as legitimate evidence of claimed experience from client. i) O&M Work Experience & performance Certificate. Or ii) Minimum 80% Payment receipt against the claimed O&M duration.

#	Description	Minimum Requirement	Documentary Proof
		PTNs/CPANs, DWDM, OLTs of 16 or more ports,e-Node B, SD-WAN and OTN. The bidder should have available capacity of having executed Installation, Commissioning and O&M of Telecom Equipment, satisfactorily in the last 10 years within India, **AND** ~~iii)~~ **Offered Product (OEM) NMS Experience**: Deployment and maintaining of NMS ~~including Helpdesk-Ticketing solution as a bundle, with Minimum 3 projects comprising of both each catering to managing minimum 12,000 network devices during last 7 years.~~ ~~OR~~ ~~Minimum 2 projects each catering to minimum 15,000 devices during last 7 years~~ ~~Or~~ ~~Minimum 1 projects each catering to~~ minimum ~~24,000~~ 15,000 devices during last ~~7~~ 10 years with maximum 3 orders/ organizations works Definition of devices: Network devices will be same as mentioned above in active devices experiences including L2 Switches. For the purpose of this criterion, the number of devices shall be counted based on the actual unique network devices deployed and maintained under the NMS solution. The same device shall not be counted multiple times merely because O&M/AMC services have been provided for multiple years. Accordingly, if an NMS solution has been deployed for 3,000 network devices and the same 3,000 devices have been maintained continuously for 4 years, the experience shall be considered as 3,000 devices only.	**For offered NMS product OEM Experience:** OEM shall have experience of Deployment and atleast one (1) year duration for O&M of network devices. (WO copy/ contract copy) with any of one document as legitimate evidence of claimed experience from client. i) O&M Work Experience & performance Certificate by clearly define deployed and maintained dates and types of devices **Note (Applicable for all experiences):** i) The evidentiary document must provide clarity on claimed purpose, i.e., OFC length in KMs or types of active equipment's alongwith numbers or O&M of OFC with length in KMs . ii) For claiming captive network experience, Internal evidentiary documents as mentioned above are essentially to be provided with endorsement of authorized signatory. (i.e., Internal evidentiary documents like NMS , GIS platform , mentioning OFC type and gauge(48/24F/etc.) ,type of installation (UG or Aerial), length of OFC, and for active elements and passive elements, integration dates as are essentially to be provided

#	Description	Minimum Requirement	Documentary Proof
		However, the bidder must demonstrate that the deployed devices were maintained under O&M/AMC for a minimum period of one (1) year, supported by the required documentary evidence. **Note 1:** The Sole bidder or any of the consortium members including lead member should meet the Technical Capability requirements either on their own or jointly for the works awarded directly by the TSPs, Category-A ISPs, IP-1, Central Government, State Government, Municipal Corporations for Smart City Projects, BharatNet SPVs, PSUs for their own network and not sub-contracted works. However, It is clarified that the work experience issued by TSPs to the executing agencies for the DIGITAL BHARAT NIDHI(DBN)/DoT awarded projects shall also be accepted. **Note 2:** The technical experience (on active elements only) for work executed in foreign countries for TSPs or Government shall also be considered. **Note 3 :** Regarding the experience certificate issued to IP-1 Service Provider, the concerned TSP or ISP has to certify that the TSP/ ISP has taken fibres on lease from the said IP-1 out of the network constructed using 24 or more fibre Under Ground OFC or ADSS/ OPGW/ Aerial OFC, as the case may be, which should be constructed and owned by the concerned IP-1 Service Provider for at least one completed year. TSP/ ISP shall also certify the Route KM of OFC with route wise details for which leasing has been done. The information may be submitted in the format mentioned. **Note:4** For installation and commissioning of active nodes, the experience certificate issued by the OEMs for the works awarded by the TSPs to the OEMs shall also be considered with valid documentary proof of WO/Certificate. **Note-5:** If a bidder(The Sole bidder or any of the consortium members) falls short of the	with endorsement of authorized signatory and CE certified.), Registered OFC lease agreement with customer. Note: The bidder's captive or infra given on lease network experience shall be considered valid only if it satisfactorily meets the requirements of GFGNL and is supported by adequate documentary evidence. ii) Digital truth from source of origin/portals will be accepted. However, GFGNL reserves the rights to seek evidence. iii) The client name with authorized contact person name, reachable postal address, official email id and telephone numbers are must for official verification. iv) Any misleading/fake information shall result into disqualification of bid with forfeiture of EMD and will be debarred for further participation in any of the GFGNL bid.

#	Description	Minimum Requirement	Documentary Proof
		experience requirement through underground OFC- implementation, upto 40% of the requirement can also be met through work of 24 or more core Aerial Fiber Cables (ADSS/ OPGW) OFC (~~deployed in BharatNet by BBNL or state SPV~~)/ / TSPs, Category-A/B ISPs, IP-1, Central Government, State Government, Municipal Corporations for Smart City Projects~~,~~ , PSUs for their own network~~.~~ (i.e., the experience requirement shall primarily be considered for Operation & Maintenance (O&M) of Underground (UG) Optical Fiber Cable (OFC) with a fiber count of 24F or higher. Further, in order to promote wider participation, it is clarified that if a bidder does not fully meet the prescribed UG OFC O&M experience criteria, up to 40% of the required O&M experience may be fulfilled through experience in aerial OFC O&M of 24F or higher fiber count. Such aerial OFC experience pertain to networks (deployed under BharatNet by BBNL or State SPVs)/ ADSS/OPGW OFC networks as required for EPC Network Construction capability mentioned above in the RFP.) **Note-6:** If any project has been executed in the consortium, the lead bidder and the consortium partners can use the same project experience for qualification individually, if not participating as the partner of same consortium. If they are participating as the consortium partners, then the experience shall be considered only once. The Experience counted once of any entity can not be counted again, However, other than consortium experience, the experience from any type of joint execution, like “teaming agreement, sub-contracting (including any EPC partnerships), backend partnership” shall not be considered. **Note-7**–The technical experience of ongoing or partially completed projects shall also be considered, provided that distinct routes/links within such projects have been successfully completed and are operational on an end-to-end basis.	

#	Description	Minimum Requirement	Documentary Proof
		For the purpose of evaluation, only those completed routes/links (from one termination point to another) which are fully functional shall be taken into account. Incomplete or partially executed segments shall not be considered.(Refer example given below in note) **Note:8** The above experience conditions can be met either through single project or number of projects mentioned in Appendix # A executed during last 10 years as on date of submission of bid**.**	
4	Router OEM Experience	The offered Make-Model for Block Router and GP Routers can be from same OEM or different OEM. However, the same or its earlier version should have been supplied for minimum 30% of required quantities for each relevant line item under the financial bid Line Items 4(a), 4(b), and 4(c)." In case of Class-I & Class-II local suppliers (as per prevalent DPIIT, GoI guidelines mentioned in tender), the offered Make-Model for each Block Router and each GP Routers or its earlier version should have been supplied for minimum 10% of required quantities.	Need to submit Following alongwith LOI/LOA/Contract agreement/PO copy. i) Delivery Challan Copy with Sign/stamp of end customer or customer's authorized agency Or ii) Successful Go-live Certificate, Or iii) Successful Acceptance Test Report.
5	Mandatory Undertaking	The Sole, and any of the consortium members & OEM should: **5.1** Not have been blacklisted/debarred/ terminated by Ministry of Communication or GFGNL or debarring order issued by Department of Expenditure (DOE), Ministry of Finance (MOF) covering all central Ministries/ Departments as per provision of OM No.F.1/20/2018-PPD by Department of Expenditure (DoE)/ MoF dated on 2nd Nov 2021/ Central Government / Any State Government / Urban Local Body (ULB) /SmartCity (SPV)/ Supreme Court of India / Any government / PSU in India as on the date of bid submission.	An undertaking signed by CEO/ Country Head/ Authorized Signatory of the company to be provided on Non – judicial stamp paper of INR 100/- or such equivalent amount and document duly attested by notary public.

#	Description	Minimum Requirement	Documentary Proof
		5.2 Not be insolvent, in receivership, bankrupt or being wound up, not have its affairs administered by a court or a judicial officer, not have its business activities suspended and must not be the subject of legal proceedings for any of the foregoing reasons. **5.3** The Sole/lead Bidder(in case of consortium) should have at least one office in Gujarat and preferably support centres/logistics for the entire state. If the Bidder is not having any office in Gujarat, then bidder should submit a letter of undertaking to open the office in Gujarat within 45 days from the date of issue of work order if he is awarded the work **5.4** The bidder(sole bidder and any of the consortium member) not have their directors and officers convicted of any criminal offence related to their professional conduct or the making of false statements or misrepresentations as to their qualifications to enter into a procurement contract within a period of three years preceding the commencement of the procurement process, or not have been otherwise disqualified. **5.5**The bidding entity(sole bidder and any of the consortium member) must not have been found guilty of any criminal offence by any court of law, in the last five (5) years	
6	MAF	**6.1** The Sole Bidder or lead Bidder (in case of consortium) should submit valid letter from each of the OEM (maximum two(2) OEM for active component and four(4) for passive component) - confirming the following: OEM shall ensure that all equipment/components/sub- components being supplied by them shall be supported for entire contract period. If the same is de-supported by the OEM for any reason whatsoever, The bidder shall replace it with an equivalent or better substitute (compatible with existing network elements) that is acceptable to Tenderer without any additional cost to the Tenderer and without impacting the performance of the solution in any manner whatsoever. In case replacement with a product from an OEM other than the OEMs proposed by	Documentary evidence such as Authorization letters, MAF (Annexure XVI) from all OEM/Vendors whose products are being quoted by the Bidder need to be attached in the bid. Copy of Type Approval Certificate given by Telecom Engineering Centre (TEC)/ TSEC issued by the Quality Assurance Circle of BSNL or proof of having applied for TAC/ TSEC (Copy of Form-B/ Form QF-103 of offered product be attached) from

#	Description	Minimum Requirement	Documentary Proof
		the bidder prior approval from GFGNL will be required. **Note:** i) If product is changed due to specific functional/technical requirement asked in this tender, then fresh TSEC/TEC certificate is required to be obtained and submitted at the time of delivery. ii) If the OEM has TSEC/TEC approval for the exactly same product which has been asked in this tender, then no fresh TSEC/TEC approval is required. But if product is changed due to specific functional requirement asked in this tender, then TSEC/TEC approval is required iii) TSEC/TAC are applicable for Hardware (Active and Passive only. iv) Maximum two MAF are allowed for active component. clearly mentioning the Primary MAF and Secondary MAF. The bidder shall not be permitted to interchange or upgrade the Secondary MAF to Primary MAF status at any stage unless expressly approved by the competent authority. v) A maximum of four (4) MAFs shall be allowed for passive equipments. These must be clearly listed in order of priority (Priority 1 to Priority 4) at the time of submission. The bidder shall not be allowed to alter, interchange, or revise the priority order of the approved passive OEMs after submission.	each OEM whose products are being quoted by the Bidder. The Bidder or the lead member (in case of Consortium) should submit valid Manufacturer Authorization Form (MAF) from maximum two(2) for all active and four(4) for passive ~~and active~~ components (Like, (all types of OF Cables, Duct, Joint Closures (SJC & BJC), FDMS & FTB~~)~~ ~~(~~Routers, RFMS, UPS & Racks). Refer the list in Annexure-XXXXV for MAF Required.* For the NMS, OSS, BSS either individual element or combination of all/any PIA ensures maximum ~~One(1)~~ Two(2) OEM MAF for each shall be allowed. TSEC/TEC issued against earlier tender(s) of DoT/BSNL/BBNL/MTNL/State Government/ Central Government/ BharatNet Projects BSNL QA registered QF-103 or Form B issued by TEC for the quoted products shall also be acceptable for eligibility to submit the Bid only. Bidders may refer the amended QA & testing clause for further details. In order to meet the delivery timelines, the successful bidder can procure and supply the material from one or

#	Description	Minimum Requirement	Documentary Proof
			maximum two quoted OEMs . However, The purpose of secondary MAF is backup arrangement can be exercised based on the caluse reference in Note:1 (ii)
7	Make In India Policy (MII) and Land Border	**7.1** The bidder(sole or lead & consortium members) shall not be allowed for purchase of active and passive equipments, and services of security, validation & functional tests devices, ground machinery for execution like HDD machines, excavators, manpower, sub-contract to contractors and other resources of proposed solution from a country which shares a land border with India unless such is registered with Competent Authority as per OM No. 6/18/2019-PPD dated 23rd July 2020 issued by Department of Expenditure, GoI and should be in compliance with make in India policy (guidelines of GoI issued vide No. P-45021/2/2017-PP(B.E.-II) dated 16th September, 2020, No. P-45021/102/2019-BE-II-(part(I) (E-50310) dated 04.03.2021 and Department of Telecommunications Gazette notification dated 29th August 2018, 21st October 2024 along with instructions as amended from time to time by Govt. of India) for promoting domestic manufactures.	Self-certification from sole or lead & consortium members and OEMs on Non-Judicial stamp of Rs. 300/- in the prescribed format (Annexure – XXI), separately.
8	Certification	**8.1** The bidder((The sole) or (lead & consortium members)) should submit at least one distinct certification from any of the below Certifications (valid at the time of bidding): • CMMI- Process Level 3 or above • ISO 9001:2015 • ISO 27001 for Information Security Management Systems • ISO/IEC 20000	Copies of valid certificates in the name of the bidding entity
9	Bharatnet Project	**9.1** If a bidder(sole or lead & consortium members) has been declared as non-performer in any DIGITAL BHARAT NIDHI(DBN) project(s) such as BharatNet Project and 4G saturation project, on the bid submission date, such bidder shall stand not eligible to submit the bid for this tender.	A Self-declaration for not being declared as non-performer in any DIGITAL BHARAT NIDHI(DBN) project(s) shall be submitted by all the members, in case of consortium bidder.

#	Description	Minimum Requirement	Documentary Proof
10	ISP/ TSP License	An ISP/ TSP license/authorization holder for Gujarat LSA shall be ineligible to participate.	The bidder and consortium partners (if any) shall submit an undertaking in the form of an affidavit, as per Annexure _9.20_Format XX Affidavit for TSP / ISP Compliance

Appendix # A

#Table-01 For Sole Bidder

The Sole Bidder should be in the business of OFC Business or Telecom or EPC in underground utility (OFC or Power or Pipeline or GAS or other utility).

Sr No.	Eligibility Criteria	Bidder's Experience
A	Financial Turn Over (In Cr)	4700 Cr
B	Experience Of **OFC Project (Kms)** In Last 10 Years	~~Three(3) Orders/Organization Work, each having 12,000Km or Rs. 500 Cr.~~ ~~**Or**~~ ~~Two(2) Orders/Organization Work, each having 15,000Km or Rs. 600 Cr.~~ ~~**Or**~~ ~~One(1) Order/Organization Work, each having 25,000Km or Rs. 1000 Cr.~~ Maximum Three (3) Orders/Organization* Work, to fulfil total 30,000 Km or of value INR 1200 Cr. of having executed EPC OFC Network Construction project in Last 10 Years
C	Experience Of **OFC- O&M (Kms)** In Last 10 Years	The bidder should have satisfactorily completed in the last 10 years within India, the O&M of any OFC network of 24 or more Core Under Ground OFC OFC for the number of 'Year Kms' (for the network for

Sr No.	Eligibility Criteria	Bidder's Experience
		which O&M has been done for at least one year) at least equal to ~~85,000~~ ~~57,000~~ 30,000 Kms (~~a~~ ~~minimum~~ upto 40% of the O&M requirement ~~should~~ can be met through O&M of 24 or more core aerial fibre cables) (~~deployed in BharatNet by BBNL or state SPV~~)/ ADSS/ OPGW OFC as required for EPC Network Construction capability mentioned above. Year Kms: If O&M of "X" Kms of OFC has been done for "N" years (N>=1), then 'Year Kms'=" X multiplied by N".
D	For Active Equipment's Experience (Numbers)	1,000 Numbers

#Table-02 For Lead Bidder and Consortium

The lead bidder and Consortium member should be in the business of OFC Business or Telecom or EPC in underground utility (OFC or Power or Pipeline or GAS or other utility).

The definition of Consortium partners is all the consortium members including lead member.

Sr No	Eligibility Criteria	Bidder's Experience to Participate
A	Financial Turn Over (In Cr) ~~For **Lead Bidder** and /or **Consortium** Partner~~	a) For the cases of (Lead with one Consortium member) Cumulative Turnover of Rs. 4700 Cr (Min Rs. 2350 Cr of Lead bidder However, the other member of the consortium should have minimum Rs. ~~400~~ 100 Cr average annual turnover during last 3 financial years) b) For the cases of (Lead with two Consortium members) Cumulative Turnover of Rs. 4700 Cr (Min Rs. 1900 Cr of Lead bidder. However, ~~the other members of~~ each consortium member should have minimum Rs. ~~400~~ 100 Cr average annual turnover during last 3 financial years)
B	Total Experience Of **OFC Project(Km)** ~~Consortium Partner and/or Lead Bidder~~ In Last 10 Years	~~Three (3) Orders/Organization Work, each having 12,000Km or Rs. 500 Cr.~~

Sr No	Eligibility Criteria	Bidder's Experience to Participate
		~~(Total Min. 6000 Km or Rs.250 Cr. experience from atleast one consortium partner)~~ ~~Or~~ ~~Two(2) Orders/Organization Work, each having 15,000Km or Rs. 600 Cr.~~ ~~(Total Min. 7500 Km or 300 Cr. experience from atleast one consortium partner)~~ ~~Or~~ ~~One(1) Order/Organization Work, each having 25,000Km or Rs. 1000 Cr.~~ ~~(Total Min. 12500 Km or Rs. 500 Cr experience from atleast one consortium partner)~~ Maximum Three (3) Orders/Organization Work, to fulfil total 30,000 Km or of value INR 1200 Cr. of having executed EPC OFC Network Construction project in Last 10 Years ~~(Bidder can fulfil the above OFC experience either individual or cummulative however, Lead bidder should have minimum 50% experience out of total cumulative experience / technical capacity of 30,000 Km or Rs. 1200 Cr of having executed EPC OFC Network Construction project in the last 10 years (from bid submission date) within India.~~ ~~At least one Consortium partner should have minimum 25% experience out of total cumulative experience / technical capacity of 30,000 Km or Rs. 1200 Cr of having executed EPC OFC Network Construction project in the last 10 years (from bid submission date) within India.)~~ (with maximum three (3) orders/organizations* each for lead and consortium members in last 10 years) **Note - Allowing prescribed OFC Project EPC Experience (30,000 Km or Rs. 1200 Cr) and OFC O&M Experience (30,000 Km) requirements to be fulfilled cumulatively by the Consortium Members

Sr No	Eligibility Criteria	Bidder's Experience to Participate
		including lead bidder. In case of a Consortium, the Lead Member shall individually fulfil at least 50% of the prescribed OFC Project EPC Experience or OFC O&M Experience requirement, as applicable, and at least one Consortium Member other than the Lead Member shall individually fulfil at least 25% of the corresponding prescribed OFC Project EPC Experience or OFC O&M Experience requirement, as applicable, within the last ten (10) years.
C	Experience Of **OFC- O&M (Kms)** ~~Consortium Partner and/or Lead Bidder~~ in Last 10 Years	The bidder should have satisfactorily completed in the last 10 years within India, the O&M of any OFC network of 24 or more Core Under Ground OFC, OFC for the number of 'Year Kms' (for the network for which O&M has been done for at least one year) at least equal to ~~85,000~~ ~~57,000~~ 30,000 Kms (~~a minimum~~ upto 40% of the O&M requirement ~~should~~ can be met through O&M of 24 or more core aerial fibre cables) (~~deployed in BharatNet by BBNL or state SPV~~)/ ADSS/ OPGW OFC as required for EPC Network Construction capability mentioned above. Year Kms: If O&M of "X" Kms of OFC has been done for "N" years (N>=1), then 'Year Kms'= "X multiplied by N". ~~Min. 50% experience from atlest one consortium partner~~ ~~(Bidder can fulfil the experience either individual or commulative however, Lead bidder should have minimum 50% experience out of total cumulative experience / technical capacity of 57,000 Km of O&M requirements of OFC in last 10 years.~~ ~~At least one Consortium partner should have minimum 25% experience out of total cumulative experience / technical capacity of 57000 Kms of O&M requirements of OFC in the last 10 years (from bid submission date) within India.)~~ **Note - Allowing prescribed OFC Project EPC Experience (30,000 Km or Rs. 1200 Cr) and OFC O&M Experience (30,000 Km) requirements to be fulfilled cumulatively by the Consortium Members including lead bidder. In case of a Consortium, the Lead Member shall individually fulfil at least 50% of the prescribed OFC Project EPC Experience or OFC O&M Experience requirement, as applicable, and at least one Consortium Member other than the Lead Member shall individually fulfil at least 25% of the corresponding prescribed OFC Project EPC Experience or OFC O&M Experience requirement, as applicable, within the last ten (10) years.

Sr No	Eligibility Criteria	Bidder's Experience to Participate
D	For **Active Equipment's** Experience (Numbers) ~~Consortium partner and/or Lead Bidder~~	1,000 Numbers Min. 500 Numbers experience from at least one consortium partner

by submission of valid documentation of same project on various deliverable will be considered.

***Illustration on 3 Orders/Organizations:**

The requirement of 3 orders/organizations means that experience from a maximum of one work order per organization will be considered. If a bidder submits two or more separate work orders from the same organization, they shall be counted as only one qualifying order/organization against the requirement of three.

For example:

Organization A: 2 work orders → Counted as 1
Organization B: 1 work order → Counted as 1
Organization C: 1 work order → Counted as 1

Total qualifying count = 3 organizations/orders

So, multiple work orders from the same organization do not increase the count; the bidder must demonstrate experience across maximum 3 distinct organizations.

****Illustration for mitigating the experience of OFC Project and OFC O&M:**

Case – 1:
a) Lead bidder criteria: If lead bidder is having more than or equal to 15,000 Km (50% of 30,000 km) of OFC project experience and having less than 15,000 Km (say, 12,000 Km) (Less than 50% of 30,000 km) of OFC O&M experience, then lead bidder will qualify for experience criteria. However, rest cumulative experience of 30,000 Km of OFC project and OFC O&M should be achieved by other consortium members.

b) Consortium bidder criteria: If consortium member(other then lead bidder) is having more than or equal to 7,500 Km (25% of 30,000 km) of OFC project experience and having less than 7,500 Km (say, 3,000 Km) (Less than 25% of 30,000 km) of OFC O&M experience, then consortium member will qualify for experience criteria. However, rest cumulative experience of 30,000 Km of OFC project and OFC O&M should be achieved by other consortium members if any including lead bidder.

Case – 2:
a) Lead bidder criteria: If lead bidder is having more than 15,000 Km (50% of 30,000 km) of OFC O&M experience and having less than 15,000 Km (say, 12,000 Km) (Less than 50% of 30,000 km) of OFC project experience, then lead bidder will qualify for experience criteria. However, rest cumulative

experience to fulfill 30,000 Km of OFC project and OFC O&M should be achieved by other consortium members.

b) Consortium bidder criteria: If consortium member is having less than 7,500 Km (25% of 30,000 km) of OFC O&M experience and having 3,000 Km (Less than 25% of 30,000 km) of OFC Project experience, then consortium member will qualify for experience criteria. However, rest cumulative experience of 30,000 Km of OFC project and OFC O&M should be achieved by other consortium members if any including lead bidder.

Note: OFC project EPC experience to consider of 30,000 Km or Rs. 1200 Cr value.

Note:1

Example for ongoing and partial completed project experience clause mentioned above:

A bidder is executing an EPC OFC project of total 1,000 km. Out of this, the project is still ongoing, but the bidder has completed and commissioned the following independent links:

- Link 1: City A to City B – 120 km (completed and operational)
- Link 2: City C to City D – 180 km (completed and operational)
- Link 3: City E to City F – 150 km (completed and operational)

Remaining 550 km is under execution and not yet completed.

In this case, only the completed and functional links totaling 450 km (120 + 180 + 150) shall be considered as eligible experience. The balance 550 km, which is incomplete, shall not be considered.

Notes:2

I. An ISP/TSP license holder for Gujarat LSA shall be ineligible to participate.
II. The Bidder may quote two MAF/as mentioned in the eligibility criteria clearly stating primary MAF and secondary MAF, etc. It is binding on the bidder to supply quoted products from primary MAF only. The purpose of secondary MAF is backup arrangement can be exercised upon written request from PIA in following circumstances only. The any other reason for change request will not be admissible.
    - Insolvency
    - Force-majure

However, if network performance issues are observed during the Project Implementation or O&M period, GFGNL shall have the right to inquire the PIA to replace or change the OEM , at no additional cost to GFGNL, in order to safeguard the long-term sustainability, reliability, and public service objectives of the BharatNet Project.

III. The PIA may mis-use the above provision and may have financial interest for change request. Therefore and to discourage casual intend a special provision is made herewith that the change request is to be made with demand draft of Rs. 10Lakhs in the name of " Gujarat Fibre Grid

Network Limited" and following deduction on the discovered rates under this RFP.

i) OFC or duct - 2% of discoved line item cost on remaining scope of financial line item 1a/1b/1c/1d/1e
i) Router or RFMS or UPS - 1% of discoved line item cost on remaining scope of line item
iii) Other each Item related to GP - 0.25% of remaining scope of discoved line item cost

IV. In case of any bidder is quoting the active equipment from multiple(maximum two as per clause above) OEMs in such case the bidder shall ensure that all quoted equipment should meet the Interoperability requirement for smooth network operations. There shall be no exclusion/ relaxation in SLA/ penalties on this account.

V. All the active and passive items asked in this RFP tender should meet the ask specifications in Technical specifications section of this tender document.

VI. All the tender items e.g. Routers, OFC, Rack Mounted Splitters, RFMS, UPS and Batteries, and Charging Control Unit should have valid Type Approval Certificate (TAC) from Telecom Engineering Centre (TEC), New Delhi or Technical Specification Evaluation Certificate (TSEC) from Quality Assurance Circle, BSNL, Bengaluru, against the respective technical specifications of this RFP. In case any of the quoted models does not have TAC/ TSEC then it should be applied for TSEC to Quality Assurance Circle, BSNL, Bengaluru or to TEC, New Delhi for the model against the technical specifications, at least one day before the bid submission date. The registration number allotted for the TSEC purpose by Quality Assurance Circle, BSNL, Bengaluru or for TAC purpose by TEC, New Delhi shall be submitted along with the bid. However, only type approved /TSEC approved products as per above specifications shall be accepted which shall have to be obtained before issuing Work Order by the Tenderer before supply.

VII. **For OFC:**

a. Against the requirement of TSEC/ QF-103 of 48F ribbon type armored OFC, bidders may also submit copy of TSEC of 48F or more Fibre Loose Tube Type Armored cable and 48F or more Fibre Ribbon type unarmored cable to meet the eligibility for submitting the bid only. However, the PIA/ OEM shall submit the valid TSEC as per the TEC GR/ Standard No.: TEC 85260:2024 with latest amendment, before supply of the OFC.
b. Against the requirement of TSEC/ QF-103 of 24F ADSS Cable, bidders may also submit copy of TSEC/ QF-103 of 24F or more Fiber ADSS Cable to meet the eligibility for submitting the bid only.
c. For the Armored Optical Fibre Cable for underground application (24F loose tube), latest TEC Standard Number- TEC 85170:2024 shall be applicable. However, bidders may submit copy of TSEC against the earlier TEC GR/ Standard No.- TEC 85170:2011 to meet the eligibility for submitting the bid only. Successful bidders shall obtain TSEC against the latest TEC Standard No. before supplies.
d. Against the requirement of TSEC/ QF-103 of 6F Aerial OF Drop Cable, bidders may also submit copy of TSEC of 4 or more Fiber Aerial Drop Cable to meet the eligibility for submitting the bid only.
e. **For UPS**: Against the requirement of TSEC/ QF-103 of UPS, bidders may also submit copy of previous TSEC of any UPS or any CCU or both to meet the eligibility for submitting the bid only. However, the PIA/ OEM shall submit the valid TSEC as per the Technical Specifications in this RFP, before supply of the UPS.

VIII. Regarding the notes mentioned in above section (viii) above, bidder shall also submit an

undertaking that it will obtain TSEC before commencement of supplies for the project.

IX. Exception in relation to OFC OEM eligibility:

a. 24F/48F/96F armored cable:

For OEM eligibility, the OEM has to meet one of the following eligibility:

1. Valid TSEC certificate for 48F/96F armored cable
2. “Applied for TSEC” for 48F/96F armored cable
3. Valid TSEC certificate for 24F armored cable
4. Valid TSEC certificate for ribbon OFC having more than 48F.

b. 48F/ 24F ADSS loose tube cable:

For OEM eligibility, the OEM has to meet one of the following eligibility:

1. Valid TSEC certificate for 48F ADSS loose tube cable
2. “Applied for TSEC” for 48F ADSS loose tube cable
3. Valid TSEC certificate for 24F ADSS loose tube cable
4. Valid TSEC certificate for ADSS loose tube cable having more than 24F.

X. Separate Clauses For OFC OEM: The Sole Bidder/lead Bidder should submit valid letter from OEMs of OFC - confirming the following:

a. OEM shall ensure that all components/sub- components being supplied by them shall be supported for the entire Contract duration.
b. During O&M phase, PIA will be, subject to adherence to the current specifications for the OFC component in the RFP, allowed to supply OFC components from other OEMs as well subjected to clause mentioned of- secondary MAF Criteria.
c. It is expected that OEM for OFC and OFC product components will not be allowed to be changed post award of the contract. Post award of work order, for any reason, if OEM fails to supply or doesn’t support products for entire implementation period, then permission will be given to replace it with an equivalent or better substitute((compatible with existing network elements), which conforms to the specifications as in current RFP - including the requirement for TSEC approval - subject to such product being acceptable to the Tenderer without any additional cost to the Tenderer and without impacting the performance of the solution and time line of the Project in any manner whatsoever subject to levy of a penalty of 2% of the Capex cost of balance supply (Financial Bid Table quantity). Bidder should ensure to warranty and spare inventories to be aligned with the RFP scope during the entire contract duration including the new / change components.

XI. In case the experience of IP-1 service provider is being submitted in the bid, then the concerned IP-1 service provider shall submit the Route-wise details, along with certificate(s) obtained from the respective TSP/ISP-Category -A, regarding Fibres leased by IP-1 service provider to them, in the below given format:

Route details	Route length	Cable size	No. of fibres leased to TSP/ ISP-A in the	Details of TSP/ISP	Period of lease	Certificate from TSP/ISP-A

(Start-End Solutions)	(In RKM)	(In terms of number of fibres)	route for at least one year			Placed at Page No. of bid

XII. The IP-1 Service Provider shall undertake that,

(a) None of the routes mentioned above have any overlapping lengths.

(b) Only one certificate is submitted for claim of experience against one route even, where fibres may have been leased out to more than one TSPs/ISPs, in the same route.

(c) If, at any stage, it comes to the notice of the purchaser or it is found on verification, that any of the routes, mentioned above, has been claimed more than once for experience claimed, where such IP-1 service provider involved either as sole bidder or as consortium partner, shall be declared nonresponsive.

Note:3 Consortium Criteria:

3.1 In case the Bidder is a Consortium, it shall comply with the following additional requirements:

(i) Number of members in a consortium shall not exceed 3 (three) including lead bidder;

(ii) Subject to the provisions of sub-clause (i) above, the Bid should contain the information required for each member of the Consortium;

(iii) Members of the Consortium shall nominate one member as the lead member (the "Lead Member"). The nomination(s) shall be supported by a Power of Attorney, in the format at Annexure-Format 9.2 and 9.3 (Format II/III), signed by all the other Members of the Consortium;

(iv) The Bid should include a brief description of the roles and responsibilities of individual members, particularly with reference to their obligations;

(v) An individual/sole Bidder cannot at the same time be member of a Consortium bidding for the tender. Further, a member of a particular Bidder Consortium cannot be member of any other Bidder Consortium.

(vi) The members of the Consortium shall have entered into a binding Joint Bidding Agreement, substantially in the form specified at Annexure-XXV (the "Joint Bidding Agreement"), for the purpose of making the Bid and submitting a Bid in the event of being qualified. The Joint Bidding Agreement, to be submitted along with the Bid, shall, inter alia:

a) Clearly mention the name of Lead Member, other members and proposed roles and responsibilities, if any, of each member;

b) include the commitment that each of the members, whose experience will be evaluated for the purposes of this RFP, shall discharge the obligations specified by the Bidder;

c) include a statement to the effect that all members of the Consortium shall be liable jointly and severally for all obligations of the consortium in relation to the Project until the Appointed Date is achieved in accordance with the contract;

d) include a provision that the Lead Member shall represent all the members of the Consortium and shall at all times be liable and responsible for discharging the functions and obligations of the Consortium; and that each member of the Consortium shall be

bound by any decision, communication, notice, action or inaction of the Lead Member on any matter related to the Contract Agreement and GFGNL shall be entitled to rely upon any such action, decision or communication of the Lead Member. GFGNL shall have the right to release payments solely to the Lead Member and shall not in any manner be responsible or liable for the inter se allocation of payments among members of the Consortium.

e) Except as provided under this RFP and the Bidding Documents, there shall not be any amendment to the Joint Bidding Agreement without the prior written consent of GFGNL.

(vii) In case of a consortium, applicant consortia shall have a valid Memorandum of Understanding (MoU)- joint bidding agreement/ Consortium Agreement among all the members signed by the CEO/ Country Head/Authorized Signatories of the companies dated prior to the submission of the bid.

a. The MoU/ Consortium Agreement shall clearly state the composition of the consortium who shall be the Lead bidder, the complete description of the partner and roles & responsibilities of the partners.
b. It also includes the commitment that each of the members, whose experience will be evaluated for the purposes of this RFP, shall discharge the obligations specified by the Bidder.
c. It includes a statement to the effect that all members of the Consortium shall be liable jointly and severally for all obligations of the consortium in relation to the Project achievement till the end of entire contract duration.
d. It includes a provision that the Lead Member shall represent all the members of the Consortium and shall always be liable and responsible for discharging the functions and obligations of the Consortium; and that each member of the Consortium shall be bound by any decision, communication, notice, action or inaction of the Lead Member on any matter related to the Contract Agreement and GFGNL shall be entitled to rely upon any such action, decision or communication of the Lead Member.
e. GFGNL shall have the rights to release payments solely to the Lead Member and shall not in any manner be responsible or liable for the inter se allocation of payments among members of the Consortium.
f. GFGNL may ask Sole bidder or lead bidder in case of consortium to open the escrow account.
g. Lead Bidder shall be solely responsible for any failure liable to the Government for the execution of the project in accordance with the terms & conditions of the bid document and a statement of this effect shall be included in the MoU/ Consortium Agreement.

(viii) The consortium bid submitted without valid MoU / Consortium Agreement shall be treated as non-responsive.

(ix) The Bid should include a brief description of the roles and responsibilities of individual members, particularly with reference to their obligations.

(x) Except as provided under this RFP and the Bidding Documents, there shall not be any amendment to the Joint Bidding Agreement/ MoU without the prior written consent from the GFGNL.

(xi) By submitting the Bid, the Bidder acknowledges that it will be qualified on the basis of Financial Capacity and Technical Capability of the Consortium Members who shall discharge their

obligation as specified in the Bid.

(xii) By submitting the Bid, the Bidder shall also be deemed to have acknowledged and agreed that in the event of a change in control of a Consortium Member or an Associate whose Technical Capacity and/ or Financial Capacity was taken into consideration for the purposes of short-listing and technically qualified under and in accordance with this RFP, the Bidder shall be deemed to have knowledge of the same and shall be required to inform the competent authority forthwith along with all relevant particulars about the same and the competent authority may, in its sole discretion, disqualify the Bidder or withdraw the work order/LOA/LOI/ from the PIA, as the case may be. In the event such change in control occurs after signing of the Agreement but prior to sign off of the project, it would, notwithstanding anything to the contrary contained in the Agreement, be deemed to be a breach of the Agreement, and the same shall be liable to be terminated without the competent authority being liable in any manner whatsoever to the Bidder. In such an event, not with standing anything to the contrary contained in the Agreement, the competent authority shall be entitled to forfeit and appropriate the Bid Security and Performance Security, as the case may be, as damages, without prejudice to any other right or remedy that may be available to the competent authority under the Bidding Documents and/ or the Agreement or otherwise.

(xiii) After the Post bid process, If any change or conflict between lead and consortium partner/s impacting tenderer deliverables, or break the consortium partnership, penalty of Rs 20 Cr will be imply to lead bidder. Addition to this, In such an event, not withstanding anything to the contrary contained in the Agreement, the competent authority shall be entitled to forfeit and appropriate the Bid Security and Performance Security, as the case may be, as damages, without prejudice to any other right or remedy that may be available to the competent authority under the Bidding Documents and/ or the Agreement or otherwise.

(xiv) The bidder (each member of the consortium) shall have company registration certificate, registration under labour laws & contract act, valid GST registration certificate and Permanent Account Number (PAN) issued by Income Tax department, Memorandum of Association and Article of Association (copy of the same should be provided).

(xv) Attested copies in respect of company's financial statements for the last three audited financial years (FY 2022-23, 2023-24 and 2024-25) shall be attached along with the bid. Bidder should submit an undertaking that Bidder (or each of the consortium members) should not have been blacklisted/debarred by any Govt. department or any PSU in India as on bid submission date.

(xvi) The award of contract shall be signed with the Lead Bidder only and the Lead Bidder shall be single Point of Contact for this Project. PBG shall be submitted by the Lead Bidder.

Note- 4:

Any Bidder found to have a Conflict of Interest shall be disqualified. In the event of disqualification, GFGNL shall be entitled to blacklist/suspend/terminate the Bidder from participation in the tendering process for the work of DST(Department of Science and Technology) / any public sector undertaking engaged in Telecom / OFC business and any work under other Centrally Sponsored Schemes for a period of one year from the Bid Date and/or forfeit and appropriate the Bid Security or Performance Security, as the case may be, as mutually agreed genuine pre-estimated loss and damage likely to be suffered and incurred by GFGNL and not by way of penalty for, inter alia, the time, cost and effort of GFGNL, including consideration of such Bidder's proposal (the "Damages") without prejudice to any

other right or remedy that may be available to GFGNL under the Bidding Documents or otherwise. Without limiting the generality of the above, a Bidder shall be deemed to have a Conflict of Interest affecting the Bidding Process, if:

I. A constituent of such Bidder, (the Bidder, its consortium member (the "Member") or Associates (or any constituent thereof) and any other Bidder, its consortium member or Associate), is also a constituent of another Bidder; or

II. ~~A constituent of the GFGNL Central NOC RFP or~~

III. Such Bidder has the same authorized representative for purposes of this Bid as any other Bidder; or

IV. Such Bidder, or any associate thereof has participated as a consultant to GFGNL in the preparation of any documents, design or technical specifications ~~.~~

Note: 5

In case a Bidder is a Consortium, then the term Bidder as used in the Clause, shall include each Member of such Consortium.

Note: 6

i. The following conditions shall be adhered to while submitting a Bid:
   a. Bidders should attach clearly marked and referenced continuation sheets in the event that the space provided in the prescribed forms in the Annexes is insufficient. Alternatively, Bidders may format the prescribed forms making due provision for incorporation of the requested information;
   b. information supplied by a Bidder (or other constituent Member if the Bidder is a Consortium) must apply to the Bidder, Member or Associate named in the Bid and not, unless specifically requested, to other associated companies or firms;
   c. in responding to the qualification submissions, Bidders should demonstrate their capabilities in accordance with the provisions of this RFP;
   d. in case the Bidder is a Consortium, each Member should satisfy the qualification requirements to the extent specified herein.

ii. Notwithstanding anything to the contrary contained herein, in the event that the Bid Date falls within 3 (three) months of the closing of the latest financial year of a Bidder, it shall ignore such financial year for the purposes of its Bid and furnish all its information and certification with reference to the 3 (three) years preceding its latest financial year. For the avoidance of doubt, financial year shall, for the purposes of a Bid hereunder, mean the accounting year followed by the Bidder in the course of its normal business.

iii. A Bidder shall be liable for disqualification and forfeiture of Bid Security if any legal, financial or technical adviser of GFGNL in relation to the Project is engaged by the Bidder, its Members or any Associate thereof, as the case may be, in any manner for matters related to or incidental to such Project during the Bidding Process or subsequent to the (i) issue of the LOA or (ii) execution of the Contract Agreement. In the event any such adviser is engaged by the Selected Bidder, as the case may be, after issue of the LOA or execution of the Contract Agreement for matters related or incidental to the Project, then notwithstanding anything to the contrary contained herein or in the LOA or the Contract Agreement and without prejudice to any other right or remedy of GFGNL, including the forfeiture and appropriation of the Bid Security or Performance Security, which GFGNL

may have thereunder or otherwise, the LOA or the Contract Agreement, as the case may be, shall be liable to be terminated without GFGNL being liable in any manner whatsoever to the Selected Bidder or PIA for the same. For the avoidance of doubt, this disqualification shall not apply where such adviser was engaged by the Bidder, its Member or Associate in the past but its assignment expired or was terminated at least 30 (thirty) days prior to the Bid Date. Nor will this disqualification apply where such adviser is engaged after a period of 3 (three) years from the Bid Date.

Note: 7

i. Change in role of Consortium Members

a. By submitting the Bid, the Bidder acknowledges that it will be qualified on the basis of Financial Capacity and Technical Capability of the Consortium Members who shall discharge their obligation as specified in the Bid.

b. By submitting the Bid, the Bidder shall also be deemed to have acknowledged and agreed that in the event of a change in the role of the Lead Member and Consortium Member whose Financial Capacity and Technical Capability was taken into consideration for the purposes of qualification under and in accordance with this RFP, the Bidder shall be deemed to have the knowledge of the same and shall inform GFGNL forthwith along with all relevant particulars about the same and GFGNL may, in its sole discretion, disqualify the Bidder or withdraw the LOA from the Selected Bidder, as the case may be. In the event such change in control occurs after signing of the agreement but prior to sign off of the project, it would, notwithstanding anything to the contrary contained in the Agreement, be deemed to be a breach of the Agreement, and the same shall be liable to be terminated without the competent authority being liable in any manner whatsoever to the Bidder. In such an event, notwithstanding anything to the contrary contained in the Agreement, the competent authority shall be entitled to forfeit and appropriate the Bid Security and Performance Security, as the case may be, as damages, without prejudice to any other right or remedy that may be available to the competent authority under the Bidding Documents and / or the Agreement or otherwise.

SECTION-4 INSTRUCTIONS TO BIDDERS

4.1 GENERAL INSTRUCTION TO BIDDERS

I. All information supplied by Bidders may be treated as contractually binding on the Bidders on successful award of the assignment by the TENDERER on the basis of this RFP. No commitment of any kind, contractual or otherwise shall exist unless and until a formal written contract has been executed by or on behalf of the TENDERER. Any notification of preferred bidder status by the TENDERER shall not give rise to any enforceable rights by the Bidder. The TENDERER may cancel this public procurement at any time prior to a formal written contract being executed by or on behalf of the TENDERER.

II. This RFP supersedes and replaces any previous public documentation, communications, and Bidders should place no reliance on such communications. The TENDERER may terminate the RFP process at any time and without assigning any reason. The TENDERER makes no commitments, express or implied, that this process will result in a business transaction with anyone.

4.2 TENDER INFORMATION

Note:1: The bidder shall submit Techno-commercial bid and financial bid simultaneously.

The tender offer shall contain two electronic envelopes viz. techno-commercial and financial envelope. The techno-commercial part/envelope will be opened first and then second electronic envelope consisting of financial bids will be opened for those bidders whose technocommercial bids are found to be responsive.

a) Techno-commercial envelope called 'Technical e-envelope' shall contain scanned copies of the following, but not limited to, documents:-

I. Bank Transaction details with UTR Number towards the successful e-payment for Tender Fee & EMD OR valid MSE (Micro or small Enterprise) certificate for claiming exemption, as the case may be.

II. DD/ Banker Cheque or Bank Guarantee or Insurance Surety Bond towards Tender Fee,EMD/Bid Security (if not submitted through e-payment mode) OR valid MSE (Micro or small Enterprise) certificate for claiming exemption, as the case may be.

III. Supporting Documents/clause by clause checklist as per detail in Annexure-XXIV of the Tender document.

IV. All required certificate(s)/ documents showing fulfillment of the eligibility criteria(s) stated in "Eligibility Criteria" section of the Tender document.

Note-2:

a. It is important to note that the bidder should not upload the same document more than once on e-tender portal in order to establish the eligibility conditions or other terms & conditions of the tender. He has to upload all documents required to establish his overall eligibility, only in

his bid, he is bidding for.

b. Financial e- envelope shall contain scanned copies of :

I. Bid Form, duly filled and signed as per format -V in section 09.

II. Price Schedule duly filled & signed both in PDF and Excel format as per Section

A pricebid/BoQ and financial bid template (online template under financial bid for entering only the summary of financial quotes rates) shall also be prepared on portal for each e-tender for bidder to enter its quoted values in financial bid part. This will only be a summary of price bid and is equivalent to “Read-out quoted rates” of any manual tendering process.

Note-3:

a. In case there is any discrepancy between the information entered by bidder in the BoQ (template at portal)/financial bid and that as per the scanned copy of signed & stamped PDF document [price schedule (Section -8] uploaded by bidder on Portal, then information as per the uploaded signed & stamped PDF document [Price schedule (Section-VII)] shall prevail over the information entered in the BoQ (template under financial bid at portal).

b. Instructions regarding offline submissions :

I. Tender Fee & EMD is required to be submitted by the bidder preferably through online payment mode as per the Bank/Beneficiary Details provided in the Tender Enquiry document. In case of MSE (Micro & Small Enterprise) bidder, valid MSE Certificate /Udyam Registration certificate, broadly covering the tendered equipment/ services, for claiming exemption of Tender Fee / EMD shall be required to be submitted.

II. However, scanned copies of the following documents (which ever applicable) are to be mandatorily uploaded by the bidder in their online Technical bid part (1st electronic Envelope i.e. Technical Envelope) on e-tender portal failing which the tender bid shall be archived unopened / rejected on e-tender portal at bid opening stage except in case the originals of these documents are already received on/before bid opening end date:

a. Bank Transaction details with UTR Number towards the successful e-payment for tender Fee/EMD.

b. DD/ Banker Cheque or Bank Guarantee or Insurance Surety Bond (if not submitted through e-payment mode).

c. Valid MSE Certificate /Udyam Registration certificate, if claiming exemptions from tender Fee/ EMD.

Moreover, Originals of Bank Instruments such as DD or EMBG or Insurance Surety Bond towards Tender Fee, EMD/Bid Security respectively (if not submitted through e-payment mode), shall be submitted by bidder on any date before or within the days mentioned in fact sheet section after bid submission end date to details given in factsheet above in a sealed envelope bearing the Tender number, Name of work, failing which the tender bid (if already opened on basis of scanned copies uploaded in 1st electronic Envelope i.e. Technical Envelope) shall be rejected.

III. During tender process, GFGNL may require the bidder to produce original copy of any document such as Power of Attorney, Integrity Pact, Bid Form, Consortium Agreement etc. submitted as scanned copy in the Technical bid part (1st electronic Envelope) on e-tender portal, which the bidder will have to comply with.

4.3 BID PRICES

I. Bids would be evaluated on the basis of the lowest assessed Bid Price (the "Bid Price") ~~excluding~~ including GST. The Bid Price shall be the total summation of financial bid for complete period of contract.
II. The bidder shall give the total composite price inclusive of all Taxes and the basic unit price and all other components of the price need to be individually indicated against the material/services it proposes to supply under the contract as per the price schedule given. The offer shall be firm in Indian Rupees. No Foreign exchange will be made available by GFGNL.
III. Prices indicated in the Price Schedule shall be entered in the following manner:
    a. Price BOQ/SOR(Section 8.1) with unit price and number of quantity proposed,
    b. The total amount of price BOQ/SOR should be matched with the total amount of financial bid.
IV. A bid submitted with an adjustable price quotation will be treated as non-responsive and rejected.
V. The price approved by GFGNL on behalf of DBN, DoT for execution of works will be exclusive of taxes as mentioned in clause subject to other terms and condition as stipulated Bid- document.

4.4 COST OF BIDDING

i. The Bidder shall bear all costs associated with the preparation and submission of the Bid. The TENDERER will in no case be responsible for those costs, regardless of the conduct or outcome of the bidding process.
ii. Cost of tender document (Tender fee, if applicable) is non-refundable and cannot be exempted in any condition.
iii. In case of non-receipt of EMD within stipulated timeline, the bid will be rejected by GFGNL/Dept. of Science & Technology as non-responsive.
iv. MSE (Micro & Small Enterprise) bidders are exempted from payment of Tender Fee and EMD(bid Security) provided they submit current and valid Udyam Registration Certificate (URC) issued from the Ministry of MSME,Udyam Registration Certificate (URC), submitted by MSE bidder in their online bid for claiming exemption from Tender Fee and EMD, must be current & valid on the date of opening of Technical bid part. Micro and Small Enterprises (MSEs) registered under Udyam Registration are eligible to avail the benefits under the policy. In case of bid by a Consortium, all the members of the Consortium should be MSE to avail the exemption from payment of Tender Fee and EMD. Kindly note that Medium Scale Units are not eligible for exemptions from tender Fee / EMD.
v. Declaration / Updation of Udyam registration by MSE bidders on nProcure is mandatory in their own benefit, failing which such MSE bidders will not be able to avail the benefits under the Public Procurement policy for MSEs order 2012 for Tenders invited electronically through nProcure.Kindly note that Medium Scale Units are not eligible for exemptions from tender Fee

and EMD.

4.5 BIDDING DOCUMENT

Bidder can download the bid document and further amendment if any freely available on https://bharatnet.gujarat.gov.in/tenders and https://gfgnltender.nprocure.com/ and upload the same on https://gfgnltender.nprocure.com/ on or before due date of the tender. Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submits a Bid not substantially responsive to the bidding documents in every respect may result in the rejection of the Bid. Under no circumstances physical bid will be accepted.

4.6 CLARIFICATION ON BIDDING DOCUMENT

1. Bidders can seek written clarifications on or before pre-Bid on e-mail on or before the date of pre-bid meeting,Gujarat Fibre Grid Network Limited., Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010. through email at bid1gfgnl@bharatnet.gujarat.gov.in, bid2gfgnl@bharatnet.gujarat.gov.in,and pmc@bharatnet.gujarat.gov.in, pmc3@bharatnet.gujarat.gov.in .
2. The queries should be submitted in the following format (in Excel file,*.xls / any open office format) only for clarification:

Sr. No.	Section No.	Clause No.	Reference/Subject	Clarification Sought

3. The responses to the pre-bid clarifications shall be notified on the website by means of Corrigendum to the RFP. No further clarification whatsoever will be entertained after the pre- bid meeting date. Bidders are responsible for duly checking the website regularly for any clarifications.

Note: Inputs/suggestions/queries submitted by bidders as part of the pre-bid meeting or otherwise shall be given due consideration by the Tender committee. However, State is neither mandated to accept any submission made by the bidder nor the bidder shall be given any written response to their submissions. If an input is considered valid by the committee the same shall be accepted and incorporated as part of the corrigendum.

4.7 AMENDMENT OF BIDDING DOCUMENTS

I. At any time prior to the deadline for submission of bids, the TENDERER, for any reason, whether

at its own initiative or in response to the clarifications requested by prospective bidders may modify the bidding documents by amendment & put on our websites.

II. All prospective bidders are requested to browse TENDERER'S website & any amendments/ corrigendum/ modification will be notified on the website and such modification will be part of RFP and binding on them.

III. To allow prospective bidders a reasonable time to take the amendment into account in preparing their bids, the TENDERER, at its discretion, may extend the deadline for the submission of bids.

4.8 LANGUAGE OF BID

I. The Bid prepared by the Bidder, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the TENDERER shall be in English.

II. In case the certificate viz. experience, registration etc. is issued in a language other than English, the bidder shall attach an English translation of the same duly attested by the bidder & the translator, to be true copy in addition to the relevant certificate.

4.9 BID SECURITY/ Earnest Money Deposit (EMD)

i. Bidders shall submit, along with their Bids, EMD as mentioned in the factsheet in the form of a in the form of an unconditional Bank Guarantee or Insurance surety bond by Bank Guarantee which should be valid for 225 days from the last date of bid submission) prescribed by the TENDERER of any Nationalized Bank including the public sector bank or Private Sector Banks or Commercial Banks or Co-Operative Banks and Rural Banks (operating in India having branch at Ahmedabad/ Gandhinagar) as per the G.R. No. EMD/10/2020/42/DMO dated 19.10.2020 issued by Finance Department or further instruction issued by Finance department time to time; in the name of "Gujarat Fibre Grid Network Limited." payable at Gandhinagar (in the specified format and must be submitted along with the covering letter.

ii. EMD and Bid validity period shall consider as 180 days from last date of bid submission with claim period of over and above 45 days. In case of price validity beyond claim period, bidder need to submit BG with extendable period for price validity including claim period

iii. EMD of all unsuccessful bidders would be refunded by GFGNL within 60 Days on selection of successful bidder.

iv. The EMD of the successful bidder would be returned upon successful submission of Performance Bank Guarantee as per the provided format.

v. EMD amount is interest free and will be refundable to the unsuccessful bidders without any accrued interest on it.

vi. The bid / proposal submitted without EMD, mentioned above, will be summarily rejected.

vii. The EMD may be forfeited, In case of a Bidder if:

1. The bidder withdraws its bid during the period of bid validity.
2. The Bidder does not respond to requests for clarification of their Bid.
3. The Bidder fails to co-operate in the Bid evaluation process.
4. In case of successful bidder, the said bidder fails:
    - Fails to sign the agreement in time.
    - Fails to submit performance bank guarantee.

4.10 POWER OF ATTORNEY(PoA)

a. The power of Attorney should be submitted and executed on the non-judicial stamp paper of appropriate value as prevailing in the respective states(s) and the same be attested by a Notary public or registered before Sub-registrar of the state(s)concerned.

b. The power of Attorney be executed by a person who has been authorized by the Board of Directors of the bidder in this regard, on behalf of the Company/institution/ Body Corporate.

c. In case, the bidder is a consortium, all the members of consortium shall execute a power of attorney in favour of the said authorized signatory.

d. Attestation of the specimen signatures of such authorized signatory who issues PoA for the bid by the Company's/ firm's bankers shall be furnished. Name,designation, Phone number, mobile number, email address and postal address of the authorized signatory shall be provided.

e. In case the Authorized signatory of Bidder is already holding a Power of Attorney to sign bids in all the tenders, then such POA shall be accepted, subject to compliance of the clause (d) above and verification of the original document as and when required by GFGNL.

4.11 LATE BIDS

i. Bids received after the due date and the specified time (including the extended period if any) for any reason whatsoever, shall not be entertained and shall be **REJECTED**.

ii. The bids submitted by telex/telegram/ fax/e-mail etc. shall not be considered. No correspondence will be entertained on this matter.

4.12 SEALING AND MARKING OF THE BID

I. Bids have to be submitted online only. In addition, some documents have to be submitted off-line in accordance with relevant instructions mentioned in following section.

a. The envelope for offline submission shall be addressed to GFGNL at the address mentioned in this document.

b. The envelope shall bear (the project name), the tender number and the words 'DONOT OPEN BEFORE' (due date & time).

c. The envelope shall indicate the name and address of the bidders to enable the documents to be returned unopened in case it is declared 'late' or rejected.
d. The responsibility for ensuring that the tenders are delivered in time would vest with the bidder.
e. Offline documents delivered in person shall be delivered at the address mentioned in the Factsheet section.GFGNL shall not be responsible if the bids are delivered elsewhere.
f. Venue date and time of tender opening as mentioned in the Factsheet section. If due to administrative reasons, the venue, date or time of Bid opening is changed, it will be displayed prominently on nProcure(clarification/corrigendum) as well as on GFGNL website.

II.Offline Submissions:

a. In addition to online submission, the bidder shall also submit the following documents offline in original to the GFGNL headoffice, as address mentioned in the factsheet section above in a Sealed Envelope, as per the instructions given in the tender document, otherwise the bid shall not be evaluated.
    - Power of Attorney for signing of Bid
    - Bid Security (EMD)as required and mentioned in Factsheet.
    - Tender Fee or supporting documents for claiming exemption of tender fee.
    - Integrity Pact.

III. Assistance to Bidders:

a. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender in clarification on bidding document section.
b. Any queries relating to the process of online bid submission or queries relating to bidding Portal in general may be directed to the 24x7 bidding Portal Helpdesk.

4.13 SECTION COMPRISING THE BIDS

- All forms / Tables, duly filled-in with necessary proofs, as required and stated in the bid document & supporting documents for eligibility criteria should be uploaded. The bid uploaded shall have the following documents:
- **BID SECURITY SECTION**

The bid security in the form of EMD to be furnished to GFGNL office as well as to be uploaded online on nProcure portal in the form of bank guarantees in favour of “Gujarat Fibre Grid Network Limited.” payable at Ahmedabad/ Gandhinagar before the last date and time of the bid submission.

- **ELIGIBILITY SECTION**

All relevant documents mentioned in eligibility criteria.

- **PRICE BID SECTION**

Priced bid (in the prescribed format)

Note: Filling up prices anywhere other than the prescribed shall render the bidder disqualified.

- **ANNEXURES & FORMATS**
  - Wherever a specific form is prescribed in the Bid document, the Bidder shall use the form to provide relevant information. If the form does not provide space for any required information, space at the end of the form or additional sheets shall be used to convey the said information. Failing to submit the information in the prescribed format, the bid is liable for rejection.
  - For all other cases, the Bidder shall design a form to hold the required information.
  - TENDERER shall not be bound by any printed conditions or provisions in the Bidder's Bid Forms.
    i. The prices shall strictly be submitted in the given format. Successful Bidder will have to supply/ provide Services with an Invoice from a place located within State of Gujarat.
    ii. Prices shall be written in both words and figures. In the event of difference, the price in words shall be valid and binding.
    iii. Offered price should be inclusive ~~exclusive~~ of all applicable taxes (anywhere in Gujarat state) However, Component included should mentioned count, unit type, price, Taxes should be mentioned separately.

4.14 BID OPENING

a. Bids shall be open in the presence of Bidder's representatives, who choose to attend. The Bidder's representatives who are present shall sign a register evidencing their attendance. Authority letter to this effect shall be submitted by the bidders before they are allowed to participate in bid opening.

b. A maximum of two representatives of any bidder shall be authorized and permitted to attend the bid opening.

i. The bids will be opened as per the details mentioned in the "*BID EVALUATION PROCESS*" clause.

ii. The financial bids of those bidders who are techno-commercially responsive will be considered for opening, subject to conditions as mentioned in the "*BID EVALUATION PROCESS*" clause.

c. The Date and Time of opening of financial bid will be intimated through e-portal or over e-mail to qualified bidders.
d. In the event of the specified date of Bid opening being declared a holiday for the GFGNL, the Bids shall be opened at the appointed time and location on the next working day.
e. The Bidder's names, bid modifications or withdrawals, discounts and the presence or absence of relevant Bid security and such other details as the TENDERER officer at his/her discretion, may consider appropriate, will be announced at the opening.
f. Immediately after the closing time, the TENDERER contact person shall open the Un-Priced Bids and list them for further evaluation.
g. Bids that are not opened at bid opening shall not be considered further for evaluation.

4.14 BID VALIDITY

a. EMD and Bid validity period shall consider as 180 days from last date of bid submission with claim period of over and above 45 days. In case of price validity beyond claim period, bidder need to submit BG with extendable period for price validity including claim period. **A Bid valid for a shorter period shall be rejected as non-responsive**.

b. In exceptional circumstances, the GFGNL may solicit Bidder's consent to an extension of the period of bid validity. The request and the responses thereto shall be made in writing. The Bid security shall also be suitably extended. A Bidder's request to modify the Bid will not be permitted.i.e., A bidder accepting the request and granting extension will not be permitted to modify its bid. However, bidder may not agree to the above request without risk of forfeting the EMD.

4.16 CONTACTING THE TENDERER

I. Bidder shall not approach the TENDERER officers outside of office hours and/ or outside the TENDERER office Premises, from the time of the Bid opening to the time the Contract is awarded. Any effort by a bidder to influence the TENDERER officers in the decisions on Bid evaluation, bid comparison or contract award may result in rejection of the Bidder's offer. If the Bidder wishes to bring additional information to the notice of the TENDERER, it should do so in writing. Any effort by a bidder to modify its bid or influence tenderer in tenderer's bid evaluation, bid comparison or contract award decision shall result in the rejection of the bid.

4.17 PLACEMENT OF ORDERS

I. GFGNL shall consider placement of orders for commercial works execution only on those eligible bidders whose offers have been found technically, commercially and financially acceptable.GFGNL reserves the right to counter offer price(s) against price(s) quoted by any bidder.

II. GFGNL reserves the right for the placement of order of entire tendered quantity on the bidder with the lowest evaluated price.

III. The Purchase Order shall be placed as per State GST compliance. Terms & Conditions related to Milestones/ Penalties shall be as per Purchase Orders.

4.18 REJECTION OF BIDS

a. The TENDERER reserves the right to reject any Bid, and to annul the bidding process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder(s) or any obligation to inform the affected Bidder(s) of the grounds for such decision.

b. While all the conditions specified in the Bid documents are critical and are to be complied, special attention of bidder is invited to the following clauses of the bid documents. Non-compliance of any one of which shall result in rejection of the bid. The bids will be rejected at opening stage if Bid security is not submitted as per RFP Clause.

c. If the eligibility condition is not met and/ or documents prescribed to establish the eligibility are not enclosed during the prescribed period, the bids will be rejected without further evaluation.

d. GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT reserves the right to disqualify the bidder for a suitable period who had on previous occasion(s) failed to execute/complete the works in time. Further, the bidders whose works do not perform satisfactory in the field in accordance with the specifications may also be disqualified for a suitable period as decided by GFGNL.

e. If clause-by-clause compliance and Nil deviation statements as prescribed are not given, the bid will be rejected at the stage of primary evaluation.

f. General Commercial conditions, Special Instructions to Bidders, Commercial Conditions of Contract & Special Technical Conditions of Contract and Technical Specifications or any other Compliance if given using ambiguous words like "Noted", "Understood", "Noted & Understood" shall not be accepted as complied. Mere "Complied" will also be not sufficient, reference to the enclosed documents showing compliances must be given.

g. Prices are not filled in as prescribed in price schedule.

h. Before outright rejection of the Bid by Bid-opening team for non-compliance of any of the provisions mentioned in clause, the bidder should be given opportunity to explain their position if required, however if the person representing the company is not satisfied with the decision of the Bid opening team, he/ they can submit the representation to the Bid opening

team immediately but in no case after closing of the tender process with full justification quoting specifically the violation of tender condition if any.

i. Bid opening team will not return the bids submitted by the bidders on the date of tender opening even if it is liable for rejection and will preserve the bids in sealed cover as submitted by taking the signatures of representatives of the participating bidder/ companies present on the occasion.
j. The in-charge of Bid opening team will mention the number of bids with the name of the company found unsuitable for further processing on the date of tender opening and number of representations received in Bid opening Minutes and if Bid opening team is satisfied with the argument of the bidder/ company mentioned in their representation and feel that there is prima- facie fact for consideration, the in-charge of the bid opening team will submit the case for review to competent authority as early as possible preferably on next working day and decision to this effect should be communicated to the bidder company within a week positively. Bids found liable for rejection and kept preserved on the date of tender opening will be returned to the bidders after issue of P.O. against the instant tender.
k. It is obligation on part of bidder to submit proper bid alongwith supporting valid documents. However, for transparent, ease of evaluation, and to control in ordinate delay the following standard process will be adopted.
l. Besides other terms & conditions highlighted in the RFP, bids may be rejected under following circumstances:

General Rejection Criteria

a. Bids submitted without or improper Tender fee and EMD.
b. Bids received through Telegraphic / Fax / E-Mail / Hard copies except, wherever required.
c. Bids which do not conform to unconditional validity of the bids as prescribed in the RFP.
d. If the information provided by the Bidder is found to be incorrect / misleading at any stage / time during the bid evaluation process or during Contract period after selection of the Bidder.
e. Any effort on the part of a Bidder to influence the Tenderer's bid evaluation, bid comparison or contract award decisions.
f. Bids received by the Tenderer after the last date & time for receipt of bids prescribed by the Tenderer in RFP.
g. Bids without Power of Attorney (Lead Bidder has to provide letter of Authorization /Power of Attorney (with board resolution) to sign this bid on his/her company letter head.) and any other document consisting of adequate proof of the ability of the authorized signatory to bind the Bidder.

Technical Rejection Criteria

a. Technical Bid containing financial details.
b. Revelation of Prices in any form or by any reason before opening of the Financial Bids.
c. Failure to furnish all information mentioned in the RFP or submission of a bid not substantially responsive to the RFP in every respect.

d. Bidders not quoting for the complete scope of work as indicated in the RFP, addendum (if any) and any subsequent information given to the Bidder.
e. Bidders not complying with the material, specifications and General Conditions of the Contract as stated in the RFP.
f. The Bidder not conforming to unconditional acceptance of all the terms and conditions set out in the RFP (and subsequent clarification/corrigendum, if any) document.
g. If the bid does not conform to the timelines indicated in the RFP.

Financial Rejection Criteria

a. Incomplete Financial Bid
b. Financial Bids that do not conform to the RFPs' financial bid format.
c. If there is an arithmetic discrepancy in the financial bid calculations, the Tenderer shall rectify the same. If the Bidder does not accept the correction of the errors, it may be rejected.

4.19 PRIMARILY BID EVALUATION

a. GFGNL on behalf of DBN, DoT shall evaluate the qualification bids submitted online to determine whether they are complete,whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and whether the bids are generally in order.
b. Arithmetical errors shall be rectified on the following basis. If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected by GFGNL. If there is a discrepancy between words and figures, the amount in words shall prevail. If the bidder does not accept the correction of the errors, its bid shall be rejected.However, any discrepancy between the required and quoted quantities will not be considerd as arithmetical errors and will be evaluated by loading of bids (if quantities quoted are lower than that put to tender).
c. Prior to the detailed evaluation GFGNL will determine the substantial responsiveness of each bid to the Bid Document. For purposes of these clauses,a substantially responsive bid is one which conforms to all the terms and conditions of the Bid Documents without material deviations. GFGNL's determination of bid's responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.
d. A bid determined as substantially non-responsive will be rejected by GFGNL and shall not subsequent to the bid opening be made responsive by the bidder by correction of the nonconformity.
e. GFGNL may waive any minor infirmity or non-conformity or irregularity in a bid which doesn't constitute a material deviation, provided such waiver doesn't prejudice or affect the relative ranking of any bidder.
f. **Evaluation and comparison of substantially responsive bids:** The evaluation and comparison of responsive bids shall be done on total cost (i.e. inclusive ~~exclusive~~ of GST) basis on the prices

of the Material/ services offered as indicated in the Financial Bid after arithmetic correction in the manner laid down herein above. Taxes claimed by vendor shall be supported by GST compliant Challans / Invoices at the time of claim for payment. It is clarified that GST will be reimbursed on actual basis subject to quoting in the bid as per prescribed rates except the changes in GST rates during the original delivery schedule.

4.20 BID EVALUATION PROCESS

I. The TENDERER will form a committee which will evaluate the proposals submitted by the bidders for a detailed scrutiny. During evaluation of proposals, the TENDERER, may, at its discretion, ask the bidders for clarification of their Proposals.

II. The bidders are expected to provide all the required supporting documents & compliances as mentioned in this RFP.

III. During the evaluation, committee may seek the clarification in writing from the bidder, if required. If bidder fails to submit the required clarifications in due time, the evaluation will be done based on the information submitted in the bid.

IV. GFGNL shall determine whether each Qualification (Techno-commercial) Bid is responsive to the requirements of the tender. A Qualification (Techno commercial) Bid shall be considered responsive if it is found to be complete as per the requirement of the tender, is unconditional and is accompanied by all the required documents.

V. The financial bids of only those bidders shall be opened which are found to be responsive.

VI. For the purpose of ordering against this tender, GFGNL intends to limit the number of technically and commercially responsive bidders from the list of such bidders arranged in increasing order of their evaluated prices from the lowest. Among all technically & commercially qualified bids, the lowest evaluated price will be termed as L1 price and the bidder quoting L1 price as L1 bidder.

VII. Tenderer may negotiate the prices with L1 Bidder, under each item/head offered by Bidder before awarding the contract without change in OEM. Bidder has to ensure not to increase the lineitem rates- during the rate negotiations.

VIII. The bids would be processed in the following sequence:

a) Stage-I: i) Tender Fee, ii) EMD, iii) Integrity pact, iv) Power Of Attorney/Authorization.

b) Stage-II: Bidder's qualification stage:

The purpose of this stage is to examine financial strength, execution credentials, quality certifications, Land border regulations and etc based on submissions as evidentiary proofs specified in the Pre-qualification criteria section. Any shortfall in the specified benchmarks is a good reason to disqualify bidder at this stage.

c) Stage-III: Financial stage:

Least cost method is applied.

If L1 Bidder is not agree or not qualify at later stage to execute the project for any reason, Tenderer may call L2 Bidder to match the price of L1. If L2 agree to match the price of L1, tenderer may award the contract. The same process may be followed for remaining qualified Bidders. Tenderer may cancel this procurement process at any time prior to a formal written contract being executed by or on behalf of the GFGNL without giving any reason. This RFP supersedes and replaces any previous public documentation & communications, and Bidders should place no reliance on such communications.

In case of any ambiguity, GFGNL may download the files from the portal and do the offline evaluation as per the parameter defined in tender document.

IX. During evaluation and comparison of bids, the Procuring Entity may, at his discretion, ask the bidder for clarifications on the bid. The request for clarification shall be given in writing by registered e-mail / speed post, asking the tenderer to respond by a specified date, and also mentioning therein that, if the tenderer does not comply or respond by the date, his tender will be liable to be rejected. Depending on the outcome, such tenders are to be ignored or considered further. No change in prices or substance of the bid including specifications, shall be sought, offered or permitted. No post-bid clarification at the initiative of the bidder shall be entertained.

X. The shortfall information/ documents will be seek out only in case of historical documents which pre-existed at the time of the tender opening and which have not undergone change since then. These should be called only on basis of the recommendations of the Technical/ Bid Evaluation committee (Example: if the Permanent Account Number, GSTN number has been asked to be submitted and the tenderer has not provided them, these documents may be asked for with a target date as above). So far as the submission of documents is concerned with regard to qualification criteria, after submission of the tender, only related shortfall documents will be asked for and considered. For example, if the bidder has submitted a contract without its completion/performance certificate, the certificate can be asked for and considered. However, no new contract should be asked for so as to qualify the bidder.

XI. GFGNL reserves the right to blacklist a bidder for a suitable period in case he fails to honour his bid without sufficient ground.

XII. GFGNL reserves the right to offer counteroffer price(s) against the price(s) quoted by any bidder.

4.21 STANDING COMMITTEE

The following standing committees at the State circle-level shall ensure monitoring/ steering of project implementation, O&M and utilization of the BharatNet infrastructure in the Gujarat State

i. State Broadband Committee (SBC): The convener of the committee at the state level shall bring in agenda related to ROW, power issues, building issues, security of equipment, OFC damages to BharatNet, etc. DoT LSA shall be the convener for such meetings.

ii. District Level Telecom Committee(DLTC): The Convener of the committee shall bring agenda related to district specific issues of O&M, utilization and other related issues in the meetings.

4.22 AWARD OF CONTRACT

I. The L1 bidder will be called to accept the award of contract. In case, the L1 bidder does not accept the award of contract or found to be involved in corrupt and/or fraudulent practices and manipulated design directly co-related with financial bid, etc. will be a good reason to disqualify L1 on account of collude way of misleading and taking advantage in competitive bid at this stage without further negotiation and justification. Then, the L2 bidder will be called to awarded the contract. Further, if the L2 bidder also declines, the tenderer may award the contract to the L3 bidder and so on till L_n.

II. GFGNL on behalf of USOF/DBN, DoT reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of contract without assigning any reason whatsoever and without thereby incurring any liability to the affected bidder or bidders on the grounds of GFGNL's action. The bidder shall have no claim of any nature whatsoever on GFGNL for period prior to signing of contract. The bidder will not be entitled to any sums in the event any work is carried out by the bidder after issue of APO in the event the contract is not signed.

4.23 NOTIFICATION OF AWARD & SIGNING OF CONTRACT

i. Prior to expiration of the period of Bid validity, the TENDERER will notify the successful Bidders and issue LoI/WO.

ii. Within two weeks of receipt of the Contract form, the successful bidder shall sign and stamp the contract and return it to the TENDERER along with performance guarantee. The performance Bank Guarantee shall be equal to 5% of the contract value valid for duration of 180 days beyond the expiry of contract.

4.24 FORCE MAJEURE

- Force Majeure shall mean any event or circumstances or combination of events or circumstances that materially and adversely affects, prevents or delays any Party in performance of its obligation in accordance with the terms of the Agreement, but only if and to the extent that such events and circumstances are not within the affected party's reasonable control, directly or indirectly, and effects of which could have prevented through Good Industry Practice or, in the case if construction activities through reasonable skill and care, including through the expenditure of reasonable sums of money. Any events or circumstances meeting

the description of the Force Majeure which have same effect upon the performance of any contractor shall constitute Force Majeure with respect to the bidder. The Parties shall ensure compliance of the terms of the Agreement unless affected by the Force Majeure Events. The bidder shall not be liable for forfeiture of its implementation / Performance guarantee, levy of Penalties, or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Agreement is the result of Force Majeure.

4.25 FORCE MAJEURE EVENTS

- The Force Majeure circumstances and events shall include the following events to the extent that such events or their consequences (it being understood that if a causing event is within the reasonable control of the affected party, the direct consequences shall also be deemed to be within such party's reasonable control) satisfy the definition as stated above. Without limitation to the generality of the foregoing, Force Majeure Event shall include following events and circumstances and their effects to the extent that they, or their effects, satisfy the above requirements:
- **Natural events** ("Natural Events") to the extent they satisfy the foregoing requirements including:
- Any material effect on the natural elements, including lightning, fire, earthquake, cyclone, flood, storm, tornado, or typhoon, any war or hostility, acts of the public enemy, civil commotion, epidemics, quarantine restrictions or act of God (hereinafter referred to as events)
- Explosion or chemical contamination (other than resulting from an act of war);
- Epidemic such as plague;
- Any event or circumstance of a nature analogous to any of the foregoing.
- Other Events ("Political Events") to the extent that they satisfy the foregoing requirements including:
- Political Events which occur inside or Outside the State of Gujarat or involve directly the State Government and the Central Government ("Direct Political Event"), including:
- Act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, civil commotion, act of terrorism or sabotage;
- Strikes, work to rules, go-slows which are either widespread, nation- wide, or state-wide or are of political nature;
- Any event or circumstance of a nature analogous to any of the foregoing.
- **Force majeure** exclusions:
- Force Majeure shall not include the following event(s) and/or circumstances, except to the extent that they are consequences of an event of Force Majeure:
- Unavailability, late delivery
- Delay in the performance of any contractor, sub-contractors or their agents;
- **Procedure for calling force** majeure:

  The Affected Party shall notify to the other Party in writing of the occurrence of the Force

Majeure as soon as reasonably practicable, and in any event within 05 (five) calendar days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate this contract nor shall either party have any claim for damages against other in respect of such non-performance or delay in performance, and deliveries under the contract shall be resumed as soon as practicable after such an event come to an end or cease to exist, and the decision of GFGNL as to whether the deliveries have been so resumed or not shall be final and conclusive. Further that if the performance in whole or part of any obligation under this contract is prevented or delayed by reasons of any such event for a period exceeding 60 days, either party may, at its option,terminate the contract.

4.26 CONTRACT OBLIGATIONS

- Once a contract is confirmed and signed, the terms and conditions contained therein shall take precedence over the Bidder's bid and all previous correspondence.

4.27 AMENDMENT TO THE AGREEMENT

Amendments to the Agreement may be made by mutual agreement by both the Parties. No variation in or modification in the terms of the Agreement shall be made except by written amendment Signed by both the parties. All alterations and changes in the Agreement will consider prevailing rules, regulations and laws applicable in the state of Gujarat.

4.28 REPRESENTATIONS AND WARRANTIES

i. Representations and Warranties by the Selected Agency:

1. It is a company duly organized and validly existing under the laws of India and has all requisite legal power and authority and corporate authorizations to execute the Agreement and carry out the terms, conditions and provisions hereof. It has in full force and effect all requisite clearances, approvals and permits necessary to enter into the Agreement and perform its obligations hereof.
2. The Agreement and the transactions and obligations hereof do not contravene its constitutional documents or any law, regulation or government directive and will not contravene any provisions of, or constitute a default under, any other Agreement or instrument to which it is a party or by which it or its property may be bound or any of its obligations or undertakings by which it or any of its assets are bound or cause a limitation on its powers or cause it to exceed its authorized powers.
3. Bidder nor any of its affiliates have immunity from the jurisdiction of a court of from legal process (whether through service of notice, attachment prior to judgement), attachment in aid of execution or otherwise). The successful bidder confirms that all representation and warrantied of the bidder set forth in the Agreement are true, complete in all respects.
4. No information given by the Successful Bidder in relation to the agreement, project documents

or any document comprising security contains any material wrong statement of fact or omits to state as fact which would be materially averse to the enforcement of the rights and remedies of TENDERER or which would be necessary to make any statement, representation or warranty contained herein or therein true and correct.

5. A comprehensive on-site warranty and Operations & Maintenance on all goods supplied under this contract shall be provided by the respective Original Equipment Manufacturer (OEM) through PIA till the end of the Contract.
6. Technical Support shall be provided by the respective OEM for till the end of the contract period.
7. The PIA shall warrant that the goods supplied under the Contract are new, non-refurbished, unused and recently manufactured; shall not be nearing End of Sale / End of Support; and shall be supported by the PIA and respective OEM along with service and spares support to ensure its efficient and effective operation for the entire duration of the contract.
8. The PIA warrants that the goods supplied under this contract shall be of the reasonably acceptable grade and quality and consisted with the established and generally accepted standards for materials of this type. The goods shall be in full conformity with the specifications and shall operate properly and safely. All recent design improvements in goods, unless provided otherwise in the Contract, shall also be made available.
9. The PIA further warrants that the Goods supplied under this Contract shall be free from all encumbrances and defects/faults arising from design, material, manufacture or workmanship (except insofar as the design or material is required by the Tenderer's Specifications).
10. The Tenderer shall promptly notify the PIA in writing of any claims arising under this warranty.
11. Upon receipt of such notice, the PIA shall, with all reasonable speed, repair or replace the defective Goods or parts thereof, without prejudice to any other rights which the Tenderer may have against the PIA under the Contract.
12. If the PIA , having been notified, fails to remedy the defect(s) within a reasonable period, the Tenderer may proceed to take such remedial action as may be necessary, at the PIA s' risk &expense and without prejudice to any other rights which the Tenderer may have against the PIA under the Contract.

ii. Representations and Warranties by the TENDERER

1. It has full legal right, power and authority to execute the said project and to enter into and perform its obligations under the Agreement and there are no proceedings pending.
2. The Agreement has been duly authorized, executed and delivered by the TENDERER and constitutes valid, legal and binding obligation of TENDERER.
3. The execution and delivery of the Agreement with the selected agency does not violate any statutory judgment, order, decree, regulation, right, obligation or rule of any court, government authority or arbitrator of competent jurisdiction applicable in relation to the TENDERER, its

assets or its administration.

4. All the equipment shall be under warranty for 3 years and will be extended for next 7 years for the contract duration without any additional cost to tenderer w.e.f. the date of commissioning. Date of commissioning for block & GP routers and associated hardware will be taken as the date on which 90% of the GPs of a sub-block , including block router is visible in state NoC NMS. The warranty shall start from 1st day on next calendar Month from dateB of go-live of Block/s. The purpose of coterminous of warranty on particular date is basically for ease in accounting.
5. For other eqipments like RFTMS,RFMS , UBR,FSO, etc. the warranty shall start from 1st day on next calender month from date of commissioning (date on which the equipment is commissioned after successful acceptance testing, this date will be date on which the SNOC is declared as commissioned).
6. The PIA/ supplier shall warrant that the stores to be supplied/works to be executed shall be new and free from all defects and faults in materials used, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for materials/works of the type ordered and shall perform in full conformity with the specifications and drawings. The PIA/supplier shall be responsible for any defect that may develop under the conditions provided by the contract and under proper use, arising from faulty material, design or workmanship such as corrosion of the equipment, inadequate quantity of material to meet equipment requirements, inadequate contact protection, deficiencies in circuit design, unapproved less depth, inadequate protections, and/or otherwise and shall remedy such defects at its own cost when called upon to do so by the Purchaser who shall state in writing in what respect the stores are faulty. This warranty shall survive inspection or payment for/ and acceptance of goods/works but shall expire (except in respect of complaints notified prior to such date) after the period specified, after the stores have been taken over under clause above.
7. If it becomes necessary for the PIA/ Supplier to replace or renew any defective portion(s) of the equipment/works under this clause, the provisions of the clause shall apply to the portion(s) of the equipment/works so replaced or renewed or until the end of the above mentioned period as specified. If any defect is not remedied by the supplier within a reasonable time, the Purchaser may proceed to get the defects remedied from other supplier/contractor/PIA etc., at the supplier's risk and expenses, but without prejudice to any other rights which the purchaser may have against the PIA/supplier in respect of such defects.
8. Replacement under warranty clause shall be made by the PIA/ free of all charges at site including freight, insurance and other incidental charges.

4.29 COURT JURISDICTION

I. Any dispute arising out on account of terms & conditions of the tender/ bid document/ evaluation of bids/ issue of APO/AWO shall be subject to the jurisdiction of the competent court

at the place from where the NIT/ tender has been issued i.e. Ahmedbad/Gandhinagar. The courts at Ahmedabad/Gandhinagar will have exclusive jurisdiction under this NIT and the contract that may be entered into pursuant to this NIT.

II. This Contract/ PO/WO is subject to jurisdiction of Court at Ahmedabad/Gandhinagar.

4.30 AUDIT AND SECURITY SERVICES

a. The PIA shall be required to provide comprehensive support to GFGNL during the Third Party Audit, Sample base audit and Security Audit etc. The PIA shall be responsible in getting the required readiness built in the network during audit for security solutions.

b. GFGNL reserves the right to inspect, monitor and assess the progress and performance of the project or sample base either itself or through another designated Contractor as it may deem fit, throughout the course of the Contract. GFGNL may demand and upon such a demand being made, GFGNL shall be provided any document, data material or any other information which it may require, to enable it to assess the progress of the project.

c. GFGNL shall also have the right to conduct, either itself or through another Contractor as it may deem fit, an audit to monitor the performance of the Contractor of its obligations/ functions in accordance with the standards committed to or required by GFGNL and the Contractor undertakes to cooperate with and provide to GFGNL or any other Contractor appointed by DIGITAL BHARAT NIDHI(DBN)/ (DoT)/ GFGNL, all documents and other details as may be required by them for this purpose.

d. The Audit is the requirement of tenderer / DBN. It is the responsibility of GFGNL/DBN to engage auditor. It is the responsibility of the bidder to provide and facilitated network data / security data/ financial data/documents on time to auditors through GFGNL.

4.31 TERM AND EXTENSION OF CONTRACT

a. The term of this Contract shall be as per Clause-Project Completion Schedule.

b. GFGNL shall reserve the sole right to grant any extension to the term of each work order above against the request of PIA and shall notify in writing to the PIA within 15 days of the request, whether it shall grant the PIA an extension of the term. The decision to grant or refuse the extension shall be at GFGNL's discretion. Accordingly, the Bank Guarantee of the same amount shall be extended up to extended period of the Contract, if required.

c. Where GFGNL is of the view that no further extension of the term be granted to the PIA, GFGNL shall notify the PIA of its decision at least 3 (three) months prior to the expiry of the Term. Upon receipt of such notice, the PIA shall continue to perform all its obligations hereunder, until such reasonable time beyond the Term of the Contract within which, GFGNL

shall either appoint an alternative Contractor or create its own infrastructure to operate such Services as are provided under this Contract. GFGNL shall make payment for work executed for the extended period post contract expiry.

4.32 THIRD PARTY DAMAGE

I. If the PIA damages other Private Service provider's cables /sewage line/ Government or public properties, such as electricity cable or roads etc., the damage charges/penalty will be paid by the PIA only as per the claim of such third party. GFGNL/DIGITAL BHARAT NIDHI(DBN), DoT will not be liable to pay any penalty, or any damage charges made by the PIA as per the indemnity clause below:

II. PIA shall either pay to third parties all expenditure incurred for restoring services which are damaged by it while carrying out the work or the same amount will be deducted from his bills. Such expenditure shall be intimated to the PIA either by Engineer in- charge or concerned third parties in writing. The amount deducted by GFGNL from his bill shall be paid to concerned third parties by the designated authority of GFGNL.

III. The bidder will be allowed to represent to GFGNL as well as to third party, however, GFGNL will only be the facilitator and bidder needs to rectify its issue or need to get NOC from the third party. Any payment liability will be solely on the bidder.

IV. However, the PIA will be solely responsible to restore the damage within 48 Hrs maximum.

4.33 UTILITIES

a. Existing utilities and roads: Notwithstanding anything to the contrary contained herein, the PIA shall ensure that the Government Instrumentalities owning the existing roads, right of way or utilities, on, under or above the Site (Route) of the New Network and/or the Existing Network are enabled by it to keep such utilities in continuous satisfactory use, if necessary, by providing suitable temporary or permanent diversions with the authority of the controlling body of that road, right of way or utility, and shall initiate and undertake at its own cost, legal proceedings for acquisition of any right of way necessary for such diversion.

4.34 PENALTY FOR CAUSING INCONVENIENCE TO THE PUBLIC

I. The bidder shall not be allowed to dump the empty cable drums/waste materials in Govt/public place, which may cause inconvenience to Govt/ Public. If the bidder does not dispose off the empty cable drums/waste materials within 3 calendar days of becoming empty, GFGNL is at liberty to dispose off the drum in any manner deemed fit and the costs incurred by GFGNL in disposing off such materials shall be borne by the Bidder. DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL may also levy a penalty- of Rs. 5000 for each such default on receipt of written case.

4.35 RESOLUTION OF DISPUTES

I. If any dispute arises between the Parties hereto during the subsistence or thereafter, in connection with the validity, interpretation, implementation or alleged material breach of any provision of the Agreement or regarding a question, including the questions as to whether the termination of the Contract Agreement by one Party hereto has been legitimate, both Parties hereto shall endeavour to settle such dispute amicably. The attempt to bring about an amicable settlement is considered to have failed as soon as one of the Parties hereto, after reasonable attempts [which attempt shall continue for not less than 30 (thirty) days], give 15 days' notice thereof to the other Party in writing. The said clause shall not be applicable in the case of cyber-crimes and any other type of security breach relating to PHI carried out by either bidder organization itself or its employees.

II. In the case dispute arising between the parties in the contract, which has not been settled amicably, any party can refer the dispute for Arbitration under (Indian) Arbitration and Conciliation Act, 1996. Such disputes shall be referred to Arbitral Tribunal as prescribed by Ministry of Law, Government of India.

III. The place of the arbitration shall be Gandhinagar, Gujarat.

IV. The Arbitration proceeding shall be governed by the Arbitration and Conciliation Act of 1996 as amended.

V. The proceedings of arbitration shall be in English language.

VI. The arbitrator's award shall be substantiated in writing. The arbitration tribunal shall also decide on the costs of the arbitration procedure.

VII. The expenses of the arbitration as determined by the arbitrators shall be shared equally between the two parties. However, the expenses incurred by each party in connection with the preparation, presentation shall be borne by the party itself.

VIII. Arbitration clause shall be only applicable in case of dispute is arising out of contract. The said clause shall not be applicable in the case of cyber-crimes and any other type of confidentiality/security breach relating to PHI carried out by either bidder organization itself or its employees.

IX. Disputes arising under this Request for Proposal (RFP) shall be formally notified in writing (Dispute Notice) by either party ("the Notifying Party") to the other party ("the Receiving Party"). The parties are encouraged to resolve disputes amicably through direct negotiation and information sharing.

X. If the dispute remains unresolved after direct negotiation and communication, the parties shall establish **Dispute Resolution Committee (DRC).**

XI. If the dispute remains unresolved after negotiations and the intervention of the DRC, either party may refer the dispute to the **Dispute Adjudication Board (DAB)** within 15 days from the date of the dispute notice.

XII. The DRC shall comprise the following members:

a) GFGNL – Gujarat Fibre Grid Network Limited- Zone Head

b) PIA (Project Implementing Agency) – Authorized Representative
c) IE (Independent Engineer) - Authorized Representative

XIII. The DAB shall consist of the following members:

a) GFGNL – MD, GFGNL
b) PIA (Project Implementing Agency) – Authorized State Representative
c) IE (Independent Engineer) - Authorized State Representative

XIV. **The mechanism for resolution of disputes through conciliation under Outside Expert Committee (OEC):**

If any difference or dispute (hereinafter referred as "Dispute") remains unresolved after negotiations and the intervention of the DAB also, the party aggrieved (hereinafter referred as "Claimant") shall refer the Dispute to conciliation under Outside Expert Committee (hereinafter referred as "OEC"). The OEC nominated by DIGITAL BHARAT NIDHI(DBN)/ GFGNL shall be comprised of members who shall be independent of the Arbitration and Conciliation Act, 1996 (hereinafter referred as "Act"). The proceedings shall be governed by Part III of the Act. The detailed procedure has been given in Annexure-A.

XV. **Settlement of commercial disputes between CPSEs inter se and CPSE(s) and Government Department(s)/ Organization(s):**

In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such disputes or differences shall be taken up by either party for resolution through AMRCD (Administrative Mechanism for Resolution of CPSE's Disputes) as mentioned in **DPE OM No. 05/0003/2019-FTS-10937** dated 14-12-2022 and the decision of AMRCD on the said dispute will be binding on both the Parties.

XVI. It is clarified that the parties have agreed that the Arbitration and Conciliation Act, 1996, shall be applicable only for the purpose of Conciliation.

XVII. In case of failure of the conciliation process between the parties and/ or refusal of either of the party to accept the outcome of the conciliation process, the aggrieved party shall be free to seek redressal of its dispute by approaching the Commercial Court.

4.36 BOOKS & RECORDS

The selected agency shall maintain adequate Documents Related to project's materials & equipment's etc. for inspection and audit by the TENDERER during the terms of Contract until expiry of the performance guarantee.

4.37 OWNERSHIP OF EQUIPMENT

i. The Tenderer shall own the services and items supplied by the PIA arising out of or in connection with this Contract only after the date of 100% Go- Live. In case of theft/physical damage (Repair not possible -RNP) to the Network components / equipment, the equipment

shall be replaced on PIA's cost till full 100% Go-live and at Tenderer's cost after full 100% Go-live. It is the PIA's responsibility to cover the risk by proper insurance cover including preventive lock and key arrangements at rack level.

ii. The asset(s) so created shall be a National Asset fully owned by the Government of India, and held on its behalf by GFGNL. At end of the contract period, the ownership of complete ring OFC including consisting of associated services which includes active and passive network components supplied during entire contract duration shall be passed on to GFGNL in working conditions according to contract agreement.

4.38 PERFORMANCE GUARANTEE

i. The successful bidder/lead bidder shall furnish the Performance Bank Guarantees as mentioned below, towards faithful performance of the contract obligation and performance of the services during contract period. In case of breach/non-compliance of contract/SLA terms and conditions, Tenderer shall invoke the PBG.

ii. All successful bidders[including MSEs(MICRO & SMALL ENTERPRISES)] who are registered with Appropriate Authority under m/o MSME) shall furnish performance security to GFGNL for an amount equal to 5% of the value of advance work order within 14days from the date of issue of Advance Purchase Order issued by GFGNL on behalf of USOF,DoT . However, if the quoted price is less than GFGNL's internal estimated cost by 15% or more, the bidder shall be required to deposit 10% of the APO value as PBG.

iii. In case of Consortium, minimum 50% of the Performance Security in both cases (5% or 10%) shall be furnished by the Lead member of the Consortium.

iv. The Bidder whose bids are accepted shall be required to submit three separate performance Bank Guarantees- one for the Project implementation phase and Maintenance Phase as below:

   a. 1st Bank Guarantee- Project Implementation Phase: The PIA, within 15 calendar days from the date of receipt of Notification of Award, shall furnish a Bank Guarantee equal to 5% of the CAPEX, valid till 100% go-live of the project or 30 months whichever is later. The Performance Bank Guarantee would be released upon submission of PBG for Entire Phase – III. Validity shall be got extended by PIA as and when required to cover the periods of extension and be valid for six months beyond the date of such extensions.
   b. 2nd Bank Guarantee-O&M Phase: The PIA, within 15 calendar days from the date of receipt of Notification of Award, shall furnish a Bank Guarantee equal to 5% of the Existing O&M(Phase I and Phase II), valid till 100% go-live of the project or 30 months whichever is later. The Performance Bank Guarantee would be released upon submission of PBG for Entire O&M Phase – III.*i.e.,bidder needs to refer "section :2 PAYMENT SCHEDULE OF PROJECT" where, per day GP O&M is explicitly mentioned for broad calculations. The selected bidder will get the

opportunity to inspect the existing O&M financials for arriving at exact PBG amount. The PBG submitted after award of contract shall be released only after new PBG for the O&M period is submitted and accepted by buyer after due verification. Bank guarantee for O&M period is to remain valid till completion of O&M period plus six months.

The amount will be calculated as below, Rs. 351 /- (GP per day amount) * 365 days* 3 Years* 14737 (Number of GPs) = ~ Rs. 566 Cr *5% = ~29 Cr. The number mentioned here is given for illustration purpose only and will be calculated on actual basis.

c. 3rd Bank Guarantee-O&M Phase: The PIA, within 15 calendar days from the date of 100% Go Live, shall furnish a Bank Guarantee equal to 5% of the OPEX value of the entire O&M Phase III project period, valid up to 180 days beyond the expiry of contract. The PBG submitted after award of contract shall be released only after new PBG for the O&M period is submitted and accepted by buyer after due verification. Bank guarantee for O&M period is to remain valid till completion of O&M period plus six months.

v. The performance guarantee will be in the form of bank guarantee for the amount equal of 5% of the value of the Order / LOI towards faithful performance of the contract obligation, and performance of the equipment during Warranty period. In case of termination of contract, the TENDERER shall invoke the PBG.

vi. The Performance Guarantee shall be valid for a period of 180 days beyond Contract period and shall be denominated in Indian Rupees and shall be in the form of an unconditional Bank Guarantee issued by all Public-Sector Banks/private banks having branch in Gandhinagar/Ahmedabad in the format provided by the TENDERER.

vii. The Performance Guarantee shall be discharged by the TENDERER and returned to the successful bidder within 30 calendar days from the date of expiry of the Performance Bank Guarantee based on written request by PIA.

viii. In the event of termination, Tenderer may invoke the Performance Bank Guarantee to enforce the remedies available with the Tenderer as per the contract agreement against the damages from the Agency that may have resulted from such default and pursue such other rights and/or remedies as may be available to the Tenderer under law.

4.39 INSPECTION AND TESTS

I. The Purchaser or its representative shall have the right to inspect and test the goods and/or works as per prescribed test schedules for their conformity to the specifications.Where the Purchaser or its authorized agency decides to conduct such tests on the premises/installation sites of the supplier or its subcontractor(s), all reasonable facilities and assistance like Testing instruments and other test gadgets including access to drawings and production data shall be furnished to the

inspectors at no charge to the purchaser.

II. Should any inspected or tested goods and/or works fail to conform to the specifications the purchaser may reject them and the supplier shall either replace the rejected goods and/or works or make all alterations necessary to meet Specification requirements free of cost to the purchaser.

III. Not compulsory, however if purchaser required,In case of goods, notwithstanding the pre-supply tests and inspections prescribed in clause I & II above, the equipment and accessories on receipt in the Purchaser's premises will also be tested during and after installation before "take over" and if any equipment or part thereof is found defective, the same shall be replaced free of all cost to the purchaser as laid down in clause below.

IV. If any equipment/good/work or any part thereof, before it is taken over under clause (V) below, is found defective or fails to fulfill the requirements of the contract, the inspector shall give the PIA notice setting forth details of such defects or failure and the PIA shall make the defective equipment/good/work good, or alter the same to make it comply with the requirements of the contract forthwith and in any case within a period not exceeding three months of the initial report. These replacements shall be made by the PIA free of all charges at site. Should it fail to do so within this time, the purchaser reserves the discretion to reject and replace at the cost of the PIA the whole or any portion of equipment/good/work as the case may be, which is defective or fails to fulfill the requirements of the contract. The cost of any such replacement made by the purchaser shall be deducted from the amount payable to the PIA.

V. When the performance tests called for have been successfully carried out, the inspector/ultimate consignee will forthwith issue a commissioning certificate. The inspector/ ultimate consignee shall not delay the issue of any "commissioning certificate " contemplated by this clause on account of minor defects in the equipment which do not materially affect the commercial use thereof provided that the supplier shall undertake to make good the same in a time period not exceeding six months. “Commissioning certificate" shall be issued by the GFGNL concerned unit within six weeks of successful completion of tests.

VI. Nothing in clause V -above shall in any way release the PIA from any warranty or other obligations under this contract.

4.40 DELIVERY/MAKING OVER WORKS EXECUTED TO GFGNL AND DOCUMENTS

I. Delivery of the goods/works and documents shall be made by the PIA in accordance with the terms specified by the purchaser in its schedule of requirements and special conditions of contracts, and the goods/works shall remain at the risk of the supplier until delivery has been completed.

II. All technical assistance for construction, commissioning and monitoring of the equipment and services shall be provided by the PIA at no extra cost during laboratory evaluation, FAT,inspection AT/ type approval, and field trial, if any.

III. The extension of delivery period against the purchase/work order, if any, should be granted subject to the condition that GFGNL shall have the absolute rights to revise the price(s) in compliance with *“Fall Clause“* and, also to levy LD/penalty for the delayed work of execution.

4.41 TERMINATION FOR DEFAULT

The GFGNL on behalf of USOF, DoT, reserves the right to suspend any of the services and/or terminate this agreement in the following circumstances by giving 30 days' notice in writing if:

I. If the bidder becomes the subject of bankruptcy, insolvency, and winding up, receivership proceedings; In case the TENDERER finds illegal use of hardware, software tools, manpower etc. that are dedicated to the project.
II. If SLAs are not maintained properly and not provide services as per SLAs then TENDERER has right to foreclose contract.
III. Upon occurrence of an event of default as set out in Clause above, either party will deliver a default notice in writing to the other party which shall specify the event of default and give the other party an opportunity to correct the default.
IV. Upon expiry of notice period unless the party receiving the default notice remedied the default, the party giving the default notice may terminate the Agreement.
V. During the notice period, both parties shall, save as otherwise provided therein, continue to perform their respective obligations under this Agreement and shall not, whether by act of omission or commission impede or otherwise interfere with party's endeavour to remedy the default which gave rise to the commencement of such notice period.
VI. The termination hereof shall not affect any accrued right or liability of either Party nor affect the operation of the provisions of the Contract that are expressly or by implication intended to come into or continue in force on or after such termination.
VII. In case of termination bidder will be paid for the work/services already delivered till the date of termination after deduction of penalties, if any.
VIII. GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT may, without prejudice to any other remedy for breach of contract, by written notice of default, sent to the Contractor, terminate this contract in whole or inpart,
    a. if the Contractor fails to deliver any or all of the goods & services within the time period(s) specified in the contract, or any extension thereof granted by GFGNL mentioned in the clause *"DELAYS IN THE CONTRACTOR'S PERFORMANCE"*,
    b. if the Contractor fails to perform any other obligation(s) under the Contract; and if the Contractor, in either of the above circumstances, does not remedy its failure within a period of 15 days (or such longer period as GFGNL may authorize in writing) after receipt of the default notice from GFGNL.
    c. if the average monthly SLA achievement (for GP uptime) is less than 80% for more than 20% of Blocks (SLA to be calculated as an average of all the GPs in a block for the cases where router not integrated at GP,i.e., GP working on GPON till the migration on IP-MPLS Router) consecutively for 3 months for the network where PIA has started O&M phase of existing network (after hand over by GFGNL) and the newly constructed

network. This condition shall be applicable after 1 year from the appointed(WO) date.

IX. In the event GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT terminates the contract in whole or in part, GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT may procure, upon such terms and in such manner as it deems appropriate, works similar to those undelivered and the Contractor shall be liable to GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT for any excess cost for such similar works. However, the Contractor shall continue the performance of the contract to the extent not terminated.

X. Termination for Insolvency: GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT may at any time terminate the Contract by giving written notice to the Contractor, without compensation to the Contractor, if the Contractor becomes bankrupt or otherwise insolvent as declared by the competent court provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL.

XI. Termination for Convenience: GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT, may, by prior written notice sent to the contractor at least 03 months in advance, terminate the Contract, in whole or in part at any time for its convenience. The notice of termination shall specify that termination is for DIGITAL BHARAT NIDHI(DBN), DoT's/ GFGNL's convenience, the extent to which performance of work under the Contract is terminated, and the date upon which such termination becomes effective.

XII. GFGNL reserves the right to discontinue the contract any time in future depending upon directions from DIGITAL BHARAT NIDHI(DBN), DoT.

4.42 INDEMNIFICATION

I. Selected agency will defend and/or settle any claims against the TENDERER that allege that Bidder service and/or branded product as supplied under this contract infringes the intellectual property rights of a third party. Selected agency will rely on Customer's prompt notification of the claim and cooperation with our defense. Bidder may modify the product or service so as to be non-infringing and materially equivalent or we may procure a license. If these options are not available, we will refund to Customer the amount paid for the affected product in the first year or the depreciated value thereafter or, for support services, the balance of any pre-paid amount or, for professional services, the amount paid. Bidder is not responsible for claims resulting from any unauthorized use of the products or services. This section shall also apply to deliverables identified as such in the relevant Support Material except that Bidder is not responsible for claims resulting from deliverables content or design provided by Customer.

4.42.1 General indemnity The PIA shall indemnify, defend, save and hold harmless DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL and its officers, servants, agents, Government Instrumentalities and GFGNL owned and/or controlled entities/enterprises, (hereinafter referred as the "Authority Indemnified Persons") against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by the PIA of any of its

obligations under this contract or any related agreement or on account of any defect or deficiency in the provision of services by the PIA to DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL or to any User, or from any negligence of the PIA under contract or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of this contract on the part of the Authority Indemnified Persons.

4.42.2 <u>Indemnity by the PIA :</u> Without limiting the generality, the PIA shall fully indemnify, hold harmless and defend the 'Authority Indemnified Persons' from and against any and all loss and/or damages arising out of or with respect to:

a. failure of the PIA to comply with Applicable Laws and Applicable Permits.
b. payment of Taxes required to be made by the PIA in respect of the income or other taxes of the PIA's contractors, suppliers, and representatives.
c. non-payment of amounts due as a result of materials or services furnished to the PIA or any of its contractors which are payable by the PIA or any of its contractors.
d. its omissions or acts of fraud, gross negligence, and willful misconduct.
e. any personal bodily injury or death of any person caused by, arising out of or in connection with its performance of this Contract; or
f. loss of or physical damage to property of GFGNL or any third party caused by, arising out of or in connection with the performance of this contract.
g. Claims towards any default by PIA, in payment of statutory benefits to its employees/sub-contractors engaged to perform the contract.
h. If any resource of the selected bidder, involved directly or indirectly, including subcontractors or labour, in the project or O&M, wilfully or negligently damages GFGNL assets, the selected bidder shall be liable to pay the expenses, if any, for loss of material or loss of network services, as may be incurred in making such damages.Furthermore, GFGNL is liable to issue the demand note on damaged asset by the PIA during project and/or O&M phase and recover the amount.
i. Further, In any case, GFGNL cable damaged by any third party, then PIA has to support on damage cost estimations and recovery of amount from respective agency based on given demand note and indemnify to the GFGNL.
j. Without limiting the generality of the provisions of this clause, the PIA shall fully indemnify, hold harmless and defend the 'Authority Indemnified Persons' from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which the 'Authority Indemnified Persons' may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by the PIA or by the PIA's Contractors in performing the PIA's obligations or in any way incorporated in or related to the Project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, the PIA shall make every reasonable effort, by giving a satisfactory

bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the PIA shall promptly make every reasonable effort to secure for GFGNL a license, at no cost to DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL authorizing continued use of the infringing work. If the PIA is unable to secure such license within a reasonable time, the PIA shall, at its own expense, and without impairing the Specifications and Standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process or modify the same so that it becomes non-infringing.

4.42.3 Notice and contest of claims :In the event that Authority Indemnified Person receives a claim or demand from a third party in respect of which it is entitled to the benefit of an indemnity under this clause it shall notify the PIA within 15 (fifteen) days of receipt of the claim or demand and shall not settle or pay the claim without the prior approval of the Indemnifying Party, which approval shall not be unreasonably withheld or delayed. In the event that the PIA wishes to contest or dispute the claim or demand, it may conduct the proceedings in the name of the GFGNL/Dot/DIGITAL BHARAT NIDHI(DBN) subject to the GFGNL/Dot/DIGITAL BHARAT NIDHI(DBN) being secured against any costs involved, to its reasonable satisfaction.

4.42.4 Defense of claims : The Authority Indemnified Persons shall have the right, but not the obligation, to contest, defend and litigate any claim, action, suit or proceeding by any third party alleged or asserted against such Party in respect of, resulting from, related to or arising out of any matter for which it is entitled to be indemnified hereunder, and reasonable costs and expenses thereof shall be indemnified by the PIA. If the PIA acknowledges in writing its obligation to indemnify the Authority Indemnified Persons in respect of loss to the full extent provided by this clause, the PIA shall be entitled, at its option, to assume and control the defense of such claim, action, suit or proceeding, liabilities, payments and obligations at its expense and through the counsel of its choice; provided it gives prompt notice of its intention to do so to the Authority Indemnified Persons and reimburses the Authority Indemnified Persons for the reasonable cost and expenses incurred by the Authority Indemnified Persons prior to the assumption by the PIA of such defence. The PIA shall not be entitled to settle or compromise any claim, demand, action, suit or proceeding without the prior written consent of the Authority Indemnified Persons , unless the PIA provides such security to the Authority Indemnified Persons as shall be reasonably required by the Authority Indemnified Persons to secure the loss to be indemnified hereunder to the extent so compromised or settled.

If the PIA has exercised its rights under Clause above, the Authority Indemnified Persons shall not be entitled to settle or compromise any claim, action, suit or proceeding without the prior written consent of the PIA (which consent shall not be unreasonably withheld or delayed).

If the PIA exercises its rights under Clause above, the Authority Indemnified Persons shall

nevertheless have the right to employ its own counsel, and such counsel may participate in such action, but the fees and expenses of such counsel shall be at the expense of the Authority Indemnified Persons, when and as incurred, unless:

(a) The employment of counsel by such party has been authorized in writing by the PIA;

(b) The Authority Indemnified Persons shall have reasonably concluded that there may be a conflict of interest between the PIA and the Authority Indemnified Persons in the conduct of the defense of such action;

(c) The PIA shall not, in fact, have employed independent counsel reasonably satisfactory to the Authority Indemnified Persons, to assume the defence of such action and shall have been so notified by the Authority Indemnified Persons; or

(d) The Authority Indemnified Persons shall have reasonably concluded and specifically notified the PIA either:

I. That there may be specific defences available to it which are different from or additional to those available to the PIA; or

II. That such claim, action, suit or proceeding involves or could have a material adverse effect upon it beyond the scope of this Contract.

Provided that if Sub-clauses (b), (c) or (d) of this Clause shall be applicable, the counsel for the Authority Indemnified Persons shall have the right to direct the defence of such claim, demand, action, suit or proceeding on behalf of the Authority Indemnified Persons, and the reasonable fees and disbursements of such counsel shall constitute legal or other expenses hereunder.

4.42.5 NO CONSEQUENTIAL CLAIMS

Notwithstanding anything to the contrary contained in this clause, the indemnities herein provided shall not include any claim or recovery in respect of any cost, expense, loss or damage of an indirect, incidental or consequential nature, including loss of profit, except as expressly provided in this Contract.

4.42.6 LIMITATION OF LIABILITY

i. Notwithstanding anything to the contrary in this Contract, the liability of the PIA towards the authority Indemnified Persons for any damages or compensation of any nature whatsoever under this Contract, shall not exceed Total cost of Project awarded to PIA. For the avoidance of doubt, the limitation hereunder shall not apply to any or all liabilities in respect of third parties.

ii. The Parties agree that the PIA's liability will be uncapped in case of any liabilities arising due to:

a. any amount payable as indemnity to DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL due to its acts or omissions or fraud, gross negligence and willful misconduct;

b. breach of any Applicable Laws or any Applicable Permits;

c. any claims or loss on account of Intellectual Property rights violation by the PIA;

d. any personal bodily injury or death of any person caused by, arising out of or in connection with its performance of this Contract; or
e. any loss of or physical damage to property of GFGNL, or any third party caused by, arising out of or in connection with the performance of this Contract.

4.42.7 SURVIVAL ON TERMINATION

I. The provisions of this clause shall survive Termination under Clauses -*Termination For Default- under the RFP*

4.43 EASEMENTS, PERMITS, LICENSES AND OTHER FACILITIES

I. The PIA shall obtain at its own cost, all easements, permits and licenses, required to execute the contract including but not limited to following:
a. "Right of Way" easements and permits.
b. Railway, Highway, Forest and other Authorities crossing permits including bridge.
c. Canal/stream crossing permits.
d. ROW

PIA shall pay applicable charges against the demand note/ estimate raised by the concerned authorities. PIA shall submit the copies of the proof of payment along with the invoices for reimbursement.

II. No extra charges will be paid to the bidders for pursuance of easements, permits, RoW etc. from the different local authorities.
III. The bidder shall be fully responsible for handling and obtaining all necessary easements, permits and licenses, for moving all construction equipment, tools, supplied materials and men across Railways and Highway, across public or private road as well as premises of any public utility within the right of user and for bearing all costs that may be incurred in respect of the same.
IV. The bidder is to confine his operation to the provided construction "Right of User" unless it has made other arrangement with the particular property owners and /or tenants such other arrangements shall be entirely at the responsibility of the bidder as to cost and arrangement as also breach and claim and shall be entitled with a copy to the Divisional Engineer.
V. The bidder will not be entitled to extra compensation for hardship and increase in cost by the cable trench being routed adjacent to or across other pipeline, Highway, Railways, telephones or poser poles and wires or guy wires, embankment, cliffs, streams or other obstacles which may physically or otherwise in any manner, restrict or limit the use of the construction "Right of User". Some construction and such contingency shall be deemed to have been provided for in the rates.
VI. At locations where the optical fiber cable trench is routed across or along railways or roads the bidder shall without extra cost provide and maintain such detours and road controls as are required by the railways or government or local agencies having jurisdiction.

(i.e., At locations where the optical fiber cable trench is routed across or along railways, roads, highways, streets, or other public rights-of-way, the bidder shall, at its own cost, provide, operate, and maintain all detours, traffic diversions, barricading, signage, safety arrangements, and road control measures as required by the concerned railway authorities, government departments, local bodies, or other competent authorities having jurisdiction.

Payment for execution shall be made only on the basis of the actual executed quantity (RKm), duly measured, verified, and accepted by the Independent Engineer (IE) and GFGNL, at the approved unit rates.

The bidder shall be deemed to have included in the quoted unit rates the cost of all associated activities required for planning, permissions, traffic management, detours, road control measures, safety provisions, restoration works, compliance with statutory requirements, and all incidental expenses. No separate payment, reimbursement, or compensation shall be payable for such activities under any circumstances.)

4.44 PROTECTION OF LIFE AND PROPERTY AND EXISTING FACILITIES

I. The bidder is fully responsible for taking all possible safety precaution during preparation for and actual performance of the works and for keeping the construction site in a reasonable safe condition. The bidder shall protect all life and property from damage or losses resulting from his construction operations and shall minimize the disturbance and inconvenience to the public.

II. If the excavation of trench alters the contours of the ground around road and highway crossing in such locations dangerous to traffic, the bidder shall at his own cost, take all necessary precautions to protect public and shall comply with all GFGNL/DST/GoG regulations as to placing of warning boards (minimum size 3' x 2'), traffic signals, barricades, flags etc., at such location. If the bidder does not put the warning signal as per above directions, then a penalty of Rs 1000/- per day shall be levied on the bidder, till the directions are complied by the bidder. The bidder shall take due precautions to avoid damages to other pipe lines, water mains, sewers, telephones, telegraphs and power conduits, laid wires poles and guy wires, railways, highways, bridges or other underground or above ground structure and/or property crossing or adjacent to the cable trench being excavated.

III. Attention of the bidder is drawn to the rules regarding laying of cables at road crossing, along Railways Bridges, highways safety precautions while working in Public Street as per Engineering Instructions.

IV. The bidder shall be solely responsible for location through approved non-destructive means and ensuring the safety of all existing underground pipeline, electrical cables, and or other structures.

V. The bidder shall be solely liable for all expense for and in respect of repairs and/or damages occasioned by injury of or damage to such underground and above structures or other properties and undertake to indemnify DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL from and against all actions, cause of actions, damages, claims and demands what-so-ever, either in law or in equity and all losses and damages and costs (inclusive between attorney and client), charges and expenses in connection therewith and/ or incidental thereto. The bidder shall take all responsibilities and risk in crossing other pipelines and cables and shall be responsible for protecting all such existing pipelines, poles, electric lines, sewers, cables or other facilities from damage by the bidder's operation in connection with the work. The bidder without cost of DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL shall promptly repair any damage incurred.

VI. The current market value of any commodities lost as a result of any damage to the aforesaid existing facilities shall be paid by the bidder together with such additional sums necessary to liquidate the personal of property damages, resulting there from.

4.45 LABOUR WELFARE MEASURES AND WORKMAN COMPENSATION

I. **Obtaining License before commencement of work**. The bidder shall obtain a valid labour license under the Contract Labour (R &A) Act 1970 and the Contract Labour (Regulation and Abolition) Central Rules 1971, before commencement of the work, and continue to have a valid license until the completion of work. The bidder shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act 1986. Any failure to fulfill this requirement shall attract the penal provisions of the contact arising out of the resultant non-execution of work.

II. **Bidders Labour Regulations**: The bidder shall ensure compliance of all statutory obligations, viz. payment of wages / salary to the workers engaged by him on regular and timely basis (by 7th every month) and any other amounts including any Statutory Dues, charges, taxes and levies payable as per the relevant statues applicable and subsequent amendment thereof and same should be sole liability of Bidder and DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL will not be liable in any circumstances whatsoever. The Bidder shall comply with the provisions of Employees State Insurance Act 1948, Workmen's Compensation Act, the Employees Provident Fund (and Family Pension Fund) Act 1952, the Payment of Bonus Act 1963, the Industrial Disputes Act 1947, the Payment of Wages Act, Contract Labour (Regulation & Abolition) Act 1970 with Contract Labour (R&A) 1971 and / or any other rules, regulations and / or statues that may be applicable from time to time or that may be introduced by the Central /State Government or Municipal / Local Self Government authorities, subsequent to the date of this agreement. Default on this account shall be deemed as sufficient ground for termination of the Agreement. In case of accident arising out of and in the course of this agreement. GFGNL as Project Management Agency and DIGITAL

BHARAT NIDHI(DBN), DoT being owner/ Principal Employer will not be responsible for payment of any compensation or under any other law. It will be the sole responsibility of the bidder for payment towards loss or compensation whatsoever.

III. The person engaged by bidder shall be treated as bidder's own employees and they will claim no privileges from DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL. The bidder will be directly responsible for administration of his employee as regards their wages, uniforms, general discipline and courteous behaviour.

IV. **Insurance:** Without limiting any of his other obligations or liabilities, the bidder shall, at his own expense, take and keep comprehensive insurance including third party risk for the plant, machinery, men, materials etc. brought to the site and for all the work during the execution and Operation & Maintenance. The bidder shall also take out workmen's compensations insurance as required by law and undertake to indemnify and keep indemnified GFGNL from and against all manner of claims and demands and losses and damages and cost (including between attorney and client) charges and expenses that may arise in regard the same or that DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL may suffer or incur with respect to end / or incidental to the same. The bidder shall have to furnish originals and/or attested copies as required by the department of the policies of insurance taken within 15 (fifteen) days of being called upon to do so together with all premium receipts and other papers related thereto which DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL may require.

The Goods (Man, Material, Machinary) supplied under this Contract shall be fully insured by the PIA, against any loss or damage during transit, upto the time it is installed at the Tenderer's designated location. For the Operations and Maintenance phase, the insurance taken should cover comprehensive risks such as fire, earthquake, theft, flood and cyclone (for wind speeds greater than 80 kmph) strorm. The PIA shall submit to the Tenderer, certificate of insurance issued by the insurance company, indicating that such insurances have been taken at the end of each payment milestone as a proof. Any slippage in procuring or renewing insurance during entire contract duration will be sole responsibility of the bidder and will not be considered as an exclusion in any condition/s and bidder will not free from their any liability.

V. **Compliance with Laws and Regulation**: During the performance of the works the bidder shall at his own cost and initiative fully comply with all applicable laws of the land and with any and all applicable by-laws, rules, regulations and orders and any other provisions having the force of law made or promulgated or deemed to be made or promulgated by the Government, Governmental agency or municipal board, Government of other regulatory or Authorized body or persons and shall provide all certificates of compliance therewith as may be required by such applicable law, By-laws, Rules, Regulations, orders and/or provisions. The bidder shall assume full responsibility for the payment of all contributions and pay roll taxes, as to its employees, servants or agents engaged in the performance of the work

specified in the bidder documents. If the bidder shall require any assignee or sub-bidder to share any portion of the work to be performed hereunder may be assigned, sub-leased or sub-contracted to comply with the provisions of the clause and in this connection the bidder agrees as to undertake to save and hold DIGITAL BHARAT NIDHI(DBN), DoT/ GFGNL harmless and indemnified from and against any/all penalties, actions, suits, losses and damages, claims and demands and costs (inclusive between attorney and client) charges and expenses whatsoever arising out or occasioned, indirectly or directly, by failure of the bidder or any assignee or sub-bidder to make full and proper compliance with the said by-laws, Rules, Regulations, Laws and Order and provisions as aforesaid.

4.46 THE PIA'S OFFICE

The PIA's office shall be equipped with the following facilities within ~~7~~ 45 days from the issue of Work Order:

(i). Land line / Mobile,

(ii). E-mail facility with PC

The PIA should have at-least one office in each Business Area of GFGNL and one nodal person in each district with above facilities. It may have more than one office in a district as per the operational need.

4.47 CONFIDENTIALITY

i. Selected agency understands and agrees that all materials and information marked and identified by the TENDERER as 'Confidential' are valuable assets of the TENDERER and are to be considered as proprietary information and property. Selected agency will treat all confidential materials and information provided by the TENDERER with the highest degree of care necessary to ensure that unauthorized disclosure does not occur. Selected agency will not use or disclose any materials or information provided by tenderer without its prior written permission.

ii. Selected agency shall not be liable for disclosure or use of any materials or information provided by the TENDERER or developed by selected agency which is:

1. Possessed by selected agency prior to receipt from the TENDERER, other than through prior disclosure by the TENDERER, as documented by selected agency's written records;
2. Published or available to the general public otherwise than through a breach of Confidentiality; or
3. Obtained by selected agency from a third party with a valid right to make such disclosure, provided that said third party is not under a confidentiality obligation to the TENDERER; or
4. Developed independently by the selected agency.

ii. If selected agency is required by judicial or administrative process to disclose any information

or materials required to be held confidential hereunder, selected agency shall promptly notify the TENDERER and allow reasonable time to oppose such process before making disclosure.

iii. Selected agency understands and agrees that any use or dissemination of information in violation of this Confidentiality Clause will cause the TENDERER irreparable harm, may leave the TENDERER with no adequate remedy at law and the TENDERER is entitled to seek to injunctive relief.

iv. The TENDERER does not follow the practice of asking Confidential Information of selected agency, however if any confidential information is required/shared by the selected agency then selected agency must clearly marked it as “Strictly confidential”. The TENDERER in turn will not share the same without prior concern of the selected agency.

v. Above mentioned “confidentiality clause” shall be applicable on both the parties i.e. the TENDERER and the successful bidder.

4.48 SERVICE TERMS

i. The entire scope of the work depends on the technical skill and experience in management of the same level or kind of capabilities.

ii. The Bidder must submit regular schedule of manpower availability.

iii. The Bidder will need to coordinate and approach various departments/Sub-departments/ Boards/Corporations during this contract.

iv. The Bidder is responsible to maintain documentation on the progress of the work and will have to update the same on regular basis. Bidder will have to submit the progress reports regularly, as per the guidelines issued by TENDERER from time-to-time.

v. All types of expenses related to transportation, consumables, stationary, printing, scanning, telephone, food, snacks, etc. in case required, must be completely borne by the Bidder as part of Contract Agreement.

vi. The bidder shall ensure that security measures, policies and procedures implemented are adequate to protect and maintain the confidentiality of the Confidential Information. Bidder also agrees and acknowledges that it shall adhere to reasonable security practices over all sensitive personal information of the said project as prescribed by various rules under I.T. Act, 2000 (as amended from time to time).

4.49 FRAUDULENT AND CORRUPT PRACTICES

i. Fraudulent practice means a misrepresentation of facts to influence a procurement process or the execution of a Contract and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the TENDERER of the benefits of free and open competition.

ii. “Corrupt Practice” means the offering, giving, receiving or soliciting of anything of value, pressurizing to influence the action of a public official in the process of Contract execution. It also includes unauthorized activities such as sharing dark fibre or infrastructure space with third

parties without following the prescribed approval process of GFGNL.

iii. The TENDERER will reject a proposal for award and may forfeit the EMD and/or Performance Bank Guarantee if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices in competing for, or in executing, contract(s).

4.50 PATENT RIGHTS, COPY RIGHT & IPR

i. The ~~service Provider~~ PIA shall indemnify tenderer against all third-party claims of infringement of copyright, patent, trademark or industrial design rights arising from use of the Goods/services. In the event of any claim asserted by a third party, the Bidder shall act expeditiously to extinguish such claim. If the Bidder fails to comply and tenderer is required to pay compensation to a third party resulting from such infringement, the Bidder shall be responsible for the compensation to the Tenderer including all expenses, court costs and lawyer fees.

ii. All the software licenses on the name of Tenderer.

iii. IPR of finished / customized product shall belongs to the tenderer.

iv. The contractor shall indemnify GFGNL against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the Service / goods or any part thereof in Indian Telecom Network.

Note:

The GFGNL shall have perpetual, irrevocable, royalty-free rights to use, operate, maintain, modify (either directly or through a third party), and enhance all project-specific deliverables, configurations, integrations, reports, documentation, interfaces, workflows, and customizations developed under the Contract for operation and maintenance of the BharatNet network through selected PIA without any additional cost to GFGNL. Existing provisions of the RFP shall otherwise remain unchanged.

4.51 APPROVALS/ CLEARANCES

i. Necessary approvals/ clearances concerned authorities, for establishing the proposed project needs to be obtained by the selected agency.

4.52 EXIT MANAGEMENT PROCEDURE

i. This Schedule sets out the provisions, which will apply on expiry or termination of the Contract Period and/ or earlier termination of the PIA and/ or the SLA for any reasons whatsoever. An Exit Management plan shall be furnished by PIA in writing to the Tenderer within 60 days on completion of the contract period or termination of the contract for default of the PIA, which shall deal with at least the following aspects of exit management in relation to the contract as a whole and in relation to the Project Implementation and Service Level monitoring.

ii. A detailed program of the transfer process that could be used in conjunction with a Replacement PIA including details of the means to be used to ensure continuing provision of the services throughout the transfer process or until the cessation of the services and of the management structure to be used during the transfer.

iii. Plans for provision of contingent support to Project and Replacement PIA for a reasonable period after transfer.
iv. Exit Management plan in case of normal termination of Contract period.
v. Exit Management plan in case of any eventuality due to which Project is terminated before the contract period.
vi. Exit Management plan in case of termination of the PIA.
vii. In the case of termination of the Project implementation and/or SLA due to illegality, the parties shall agree at that time whether, and if so during what period, the provisions of this Schedule shall apply.
viii. The parties shall ensure that their respective associated entities carry out their respective obligations set out in this Exit Management Schedule.
ix. The Exit Management Period starts, in case of expiry of Contract, 3 months before the Contract comes to an end or in case of earlier termination of Contract, on the date of service of termination orders to the ~~service Provider~~ PIA. The Exit Management Period ends on the date agreed upon by the tenderer or six months after the beginning of the Exit Management Period, whichever is earlier.
x. During this period, the ~~service Provider~~ PIA should:
    a. Deliver the services.
    b. Provide necessary support to the Tenderer's staff, nominated agency, or replacement ~~service Provider~~ PIA.
    c. Permit reasonable access to its employees and facilities to the tenderer and/or any replacement ~~service Provider~~ PIA for knowledge transfer.
xi. Payments during the Exit Management Period shall be made in accordance with the Terms of Payment Schedule.
xii. The handholding support will include but not be limited to, conducting detailed walkthrough and demonstrations for handing over all relevant documentation, addressing the queries/clarifications of the new agency with respect to the working / performance levels of the infrastructure, conducting training sessions etc.
xiii. The ~~service Provider~~ PIA shall permit the tenderer and/or any replacement ~~service Provider~~ PIA to have reasonable access to its employees and facilities as reasonably required by the tenderer to understand the methods of delivery of the Services employed by the ~~service Provider~~ PIA and to assist appropriate knowledge transfer.
xiv. Exit Management plan at the minimum adhere to the following:
    1. Three (3) months of the support to Replacement PIA post termination of the Contract
    2. Complete handover of the Planning documents, bill of materials, technical specifications of all equipment, user manuals, guides, IPR, network architecture, change requests if any reports, documents, and other relevant items to the Replacement PIA / Tenderer
    3. Certificate of Acceptance from authorized representative of Replacement PIA issued to the PIA on successful completion of handover and knowledge transfer
    4. In the event of termination or expiry of the contract, Project Implementation or Service Level monitoring, both PIA and Tenderer shall comply with the Exit Management Plan.

5. During the exit management period, the PIA shall use its best efforts to deliver the services.

4.53 REVIEW AND EXTENSION OF O&M WORK DURING THE CONTRACT

I. **During the existing Contract duration**: GFGNL is expecting that the BharatNet network will be the captive network for the Government Services of Gujarat as well as for the public and private sectors over the time. Hence, Considering the rural centric model and the importance of digital infrastructure for the state, the PIA's performance should meet the Network uptime consistently above 90% of entire network. In Case of repetitive default in uptime of the network, and substantial delay in service provisioning, GFGNL reserve the rights to review (during the entire contract duration) the past one year performance of the selected bidder and may take strict actions including but not limited to disagreement of O&M continuations for the next eligible year as per the contract conditions to PIA. The bidder has to support on handover of the all network assets, spare inventories and associated services in healthy conditions- along with required training to the new onboarded agency as per the intimations from the GFGNL.

II. Contract Extension:

(a) The term of this Contract shall be as per Schedule mentioned in the factsheet and the milestones mentioned.

(b) GFGNL shall reserve the sole right to grant any extension to the term of work order above against the request of PIA and shall notify in writing to the PIA within 15 days of the request,whether it shall grant the PIA an extension of the term. The decision to grant or refuse the extension shall be at GFGNL's discretion. Accordingly, the Bank Guarantee of the same amount shall be extended up to extended period of the Contract, if required.

(c) Beyond 10th year, the equipment which is not EoSL (End of Support Life), can be continued along with the network for O&M as per decision of GFGNL/DIGITAL BHARAT NIDHI(DBN)/ DoT and also with the consensus of PIA. The OPEX payable after 10th year will be enhanced annually by 4% (i.e. 11th year will have OPEX of 6.76%, 12th year will be 7.02% and so on) till the continuity of the O&M of the network by PIA.

(d) Where GFGNL is of the view that no further extension of the term be granted to the PIA, GFGNL shall notify the PIA of its decision at least 3 (three) months prior to the expiry of the Term. Upon receipt of such notice, the PIA shall continue to perform all its obligations hereunder, until such reasonable time beyond the Term of the Contract within which, GFGNL shall either appoint an alternative Contractor or create its own infrastructure to operate such Services as are provided under this Contract. GFGNL shall make payment for work executed for the extended period post contract expiry.

4.54 SUPPORT FROM EXTERNAL AGENCY

I. No Data/ Information should be sent out of the premise without obtaining prior written confirmation from the TENDERER. The successful bidder shall be allowed to obtain advisory support from within its organization towards legal or contractual vetting of drafts.

4.55 GFGNL'S RIGHT TO BAN BUSINESS DEALINGS

I. GFGNL reserves the right to ban business dealings with a bidder for a suitable period in case the bidder fails to honour its bid without sufficient grounds.

4.56 USE OF AGREEMENT DOCUMENTS AND INFORMATION

i. The Bidder shall not without prior written consent from TENDERER disclose the Agreement or any provision thereof or any specification, plans, drawings, pattern, samples or information furnished by or on behalf of TENDERER in connection therewith to any person other than the person employed by the Bidder in the performance of the Agreement. Disclosure to any such employee shall be made in confidence and shall extend only as far as may be necessary for such performance.

ii. The Bidder shall not without prior written consent of TENDERER make use of any document or information made available for the project except for purposes of performing the Agreement.

iii. All project related documents issued by TENDERER other than the Agreement itself shall remain the property of TENDERER and Originals and all copies shall be returned to TENDERER on completion of the Bidder's performance under the Agreement, if so required by the TENDERER.

4.57 PROJECT DELIVERABLES

The suggested (but not limited to) list of deliverables needs to be submitted to GFGNL / Authorized Representative as per the scope of work:

- Training manuals and user manuals
- RCA Documents
- Weekly Status Report & Monthly Status Report
- Additional details mentioned in various sections of RFP , deliverable milestones, MIS Reports, O&M measurement criteria's, etc

4.58 LIQUIDATED DAMAGES (LD)

I. Compensation of loss on account of late delivery (actually incurred as well as notional) where loss is pre-estimated and mutually agreed to is termed as Liquidated Damages (LD). The law allows recovery of pre-estimated loss provided such a term is included in the contract, and there is no need to establish actual loss due to late supply. However, it would strengthen the Procuring Entity's rights if it were established and kept on record that inconvenience and loss have been caused due to the delay in supplies, though the loss cannot be exactly quantified, and hence liquidated damages are applicable as a genuine pre-estimate of the loss.

4.59 No Clause (No Information)

4.60 TAXES & DUTIES

Bidder is liable for all taxes and duties etc. as may be applicable from time to time.

i. The quoted offer should be exclusive of Taxes. Taxes shall be paid extra on actual, as applicable. The taxes prevailing at the time of raising the invoice shall be paid. GFGNL shall deduct appropriate tax as applicable at source from the payment against the delivery &services and corresponding TDS certificate shall be issued at the end of respective quarter.

ii. Invoices should be raised in name of *"Gujarat Fibre Grid Network Limited"* only as per milestone mentioned above in the RFP related sections.

iii. Invoices in the name of DBN, DOT or any authority designated by them clearly indicating break up details of composite price i.e. Basic, Goods and Services Tax (GST), any other Duties and Taxes, etc.

iv. All Invoices should be raised from the Gujarat.

v. If any additional tax/cess/any government levy is applicable then reimbursement will be on actual basis submission of valid payment proof.

vi. Payments should be subject to deductions of any amount for which the PIA is liable under the RFP conditions. Further, all payments shall be made subject to deduction of TDS (Tax deduction at Source) as per the current Income-Tax Act.

vii. The tax component i.e. Goods and Service Tax (GST) as applicable shall be mentioned separately and Payments shall be released only on satisfactory acceptance of the deliverables by GFGNL for each task for End-to-End connectivity for individual locations.

viii. All payments shall be released after certification of Delivery & Implementation and acceptance by GFGNL.

ix. Payment shall be released by the GFGNL against the invoices raised by bidder within 30 calendar days from the date of providing all the relevant documents and are complete in all reference.

x. All payments shall be made through RTGS only.

xi. Statutory variation in the rate of GST, taking place between the date of award of contract and the original / refixed delivery period or service period, shall be to the purchaser's account. For claiming any change in price due to such Statutory variation, the successful bidder shall have to lodge claim before the purchaser providing documentary evidence of change in rate of GST taking place after the date of award of contract and the date of supply within the original / refixed delivery period. Purchaser shall issue necessary amendment in the contract to enable generation of supplementary invoice or revised invoice as the case may be.

xii. No increase in price on account of statutory increase in the rate of GST taking place during the period of delivery period extension with liquidated Damages shall be admissible. Nevertheless, the purchaser shall be entitled to the benefit of any decrease in price on account

of reduction in GST taking place during extended delivery period.

xiii. If the PIA fails to furnish necessary supporting documents i.e. GST invoices in the name of GFGNL. and also fails to upload the information on GSTN in respect of the Duties/taxes for which input tax credit is available to the purchaser i.e. GFGNL (as applicable to this tender), the amount pertaining to such Duties/Taxes will be deducted from the payment due to the PIA.

xiv. Tax amount will be paid to the PIA only after PIA declares the details of the invoices in its return in GSTR-1 and GSTR-3B uploaded by the PIA and after submission of proofs of GST compliances.

xv. TDS/TCS under Income Tax Act 1961 & GST Acts shall be deducted by GFGNL.

xvi. GFGNL can adjust/ forfeit Bank Guarantee obtained from the PIA against any loss due to non compliances towards Tax Laws on account of PIA's default.

xvii. In case GFGNL has to pay GST on reverse charge basis, the PIA would not charge GST on its invoices. Further, the PIA undertakes to comply with the provisions of GST law as may be applicable.

4.61 SET OFF

Any sum of money due and payable to the Contractor (including security deposit refundable to him) under this contract may be appropriated by GFGNL or any other person(s) contracting through GFGNL and set off the same against any claim of GFGNL such other person or person(s) for payment of a sum of money arising out of this contract.

4.62 FALL CLAUSE

I. At any time during the contract (a) if it comes to the notice of GFGNL regarding reduction of price for the same or similar works; and/ or (b) the prices received in a new tender for the same or similar works are less than the prices chargeable under the contract. The prices would be determined as follows:

a. The prices once fixed will remain valid during the scheduled time period except for the provisions in clause of “Price” of this RFP.

b. GFGNL, for the extended period, if any, will determine and intimate the new price, taking into account various related aspects such as quantity, geographical location etc., and the date of its effect for the balance works to the vendor. In case the vendor does not accept the new price to be made applicable during the extended period and the date of its effect, GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT shall have the right to terminate the contract without accepting any further works. This termination of the contract shall be at the risk and responsibility of the Contractor and GFGNL reserves the right to give work order for the balance works at the risk and cost of the defaulting vendor besides considering the forfeiture of its performance security.

c. The Contractor while applying for extension of time for works, if any, shall have to provide

an undertaking as "We have not reduced the price, and/ or offered price the same or similar works to any person/organization including Department of central/state Government or any central/state PSU at a price lower than the price chargeable under the contract for scheduled time period."

d. In case undertaking is not applicable as above, the vendor will give the details of prices, quantity etc. to GFGNL, while applying extension of delivery period.

4.63 ISSUE OF ADVANCE PURCHASE/WORK ORDER

i. The issue of an Advance Purchase/work Order shall constitute the intention of GFGNL as an agent of DIGITAL BHARAT NIDHI(DBN) to enter into contract with the bidder. It is clarified that issue of APO/WO does not mean that GFGNL is bound to issue purchase/work order.

ii. The bidder shall within ~~14~~ 15 calendar days of issue of the advance purchase/work order, shall give its acceptance along with performance security (PBG or insurance security bond) in conformity with proforma enclosed in the relevant section provided with the bid document.

iii. Non-submission of acceptance and PBG in the prescribed period will automatically result in withdrawal of APO or levy of penalty, alongwith other actions w.r.t. EMD/ business banning etc. unless the period of acceptance is extended by GFGNL subsequently.

iv. In case, the extension is given by GFGNL, the period of extension may lead to commensurate reduction in delivery timelines. The extension by GFGNL shall be in writing only.

4.64 SIGNING OF CONTRACT

i. After submission of acceptance of Advance PO/ Advance WO along with performance security; Agreement, signed between the successful bidder and GFGNL central Office (on behalf of DIGITAL BHARAT NIDHI(DBN), DoT), shall constitute the award of contract to the successful bidder.

ii. After signing of agreement, Purchase Order(s)/ Work Order(s) shall be issued to the successful bidder (PIA).

4.65 ANNULMENT OF AWARD

I. Failure of the successful bidder to comply with the requirement of clauses mentioned above i.e., *SIGNING OF CONTRACT* and/or *ISSUE OF ADVANCE PURCHASE/WORK ORDER* shall constitute sufficient ground for the annulment of the award and the forfeiture of the bid security in which event GFGNL on behalf of DBN/DoT may make the award to any other bidder at the discretion of GFGNL or call for new bids.

4.66 VERIFICATION OF DOCUMENTS AND CERTIFICATES

I. The bidder will verify the genuineness and correctness of all documents and certificates, including experience/ performance certificates, issued either by the bidder or any other firm/ associate before submitting them in the bid. The onus of proving genuineness of the submitted documents would rest with the bidder.

II. As per requirement of the tender's conditions, if any document/ paper/ certificate submitted by the participant bidder is found to be false/ fabricated/ tempered/ manipulated at any stage during bid evaluation or award of contract, then the bid security of the bidder would be forfeited, and the bidder would be disqualified from the tender. Action would also be taken for banning of business dealing with the defaulting firm. In case contract has already been awarded to the bidder, then PBG, would be forfeited and the contract would be rescind/ annulled and GFGNL would be at liberty to complete works from any other source at the risk and cost of the defaulting bidder. Action would also be taken for banning business dealing with the defaulting firm. The various actions which GFGNL shall be at liberty to take are more specifically set out in Appendix-1 of critical instructions to bidder below.

4.67 APPENDIX-1 - CRITICAL INSTRUCTIONS TO BIDDER

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
1(a)	Submitting fake / forged	i) Rejection of tender bid of respective Vendor. ii) Banning of business upto 3 years which implies barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST//GFGNL upto 3 years from date of issue of banning order. iii) Termination/ Short Closure of APO/ PO/WO, if issued. This implies non-acceptance of further supplies / work & services except to make the already received material work/complete work in hand. iv) EMD, if submitted, shall also be forfeited, in case of default at para (c).
	a) Bank / Insurance surety bond Instruments with the bid to meet terms & condition of tender in respect of tender fee and/ or EMD;	
	b) Certificate for claiming exemption in respect of tender fee and EMD ;	
	(c) Bank Guarantee/ Insurance surety bond Instruments submitted towards performance security or any type of security and detection of default at any stage from receipt of bids till award of APO/ issue of PO/WO.	
	Note: - Payment for already received supplies/ completed work shall be made as per terms & conditions of PO/ WO.	

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
1(b)	Submitting fake / forged documents towards meeting eligibility criteria such as experience capability, supply proof,registration with Goods and Services Tax, Income departments other and any Tax supporting documents other towards terms & with the bid to meet conditions terms & condition of tender	
	(i) If detection of default is prior to award of APO	i)Rejection of Bid & ii) Forfeiture of EMD. iii) Banning of business for three years upto which implies Barring further dealing with the vendor for procurement of & Services Goods including participation in future tenders invited by DST//GFGNL for upto three years from the date of issue of banning order.
	(ii) If detection of default after issue of APO but before receipt of PG/ SD (DD, BG etc.)	i) Cancellation of APO, ii) Rejection of Bid & iii) Forfeiture of EMD, if submitted. iv) Banning of business for three years upto which implies Barring further dealing with the vendor for procurement of & Services Goods including participation in future tenders invited by DST//GFGNL for upto three years from the date of issue of banning order.
	(iii) If detection of default after receipt of PG/ SD (DD,BG etc.) .	i) Cancellation of APO ii) Rejection of Bid & iii) Forfeiture of PG/ SD. However, on realization of PG/ SD amount,EMD, if not already released shall be returned. iv) Banning of business for upto three years which implies Barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST//GFGNL for upto three years from the date of issue of banning order.

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
	(iv) If detection of default after signing of Agreement/ issue of PO/ WO	i) Termination/ Short Closure of PO/WO and Cancellation of APO ii) Rejection of Bid & iii) Forfeiture of PG/ SD. However on realization of PG/ SD amount, EMD, if not released shall be returned. iv) Banning of business for upto three years which implies Barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST//GFGNL for upto three years from the date of issue of banning order.
	Note 3:- However, settle bills for the material received in correct quantity and quality if pending items do not affect working or use of supplied items.	
	Note 4:- No further supplies are to be accepted except that required to make the already supplied items work.	
2	If vendor or his representative uses violent/ coercive means viz. Physical / Verbal means to threatens GFGNL Executive / employees and/ or obstruct him from functioning in discharge of his duties & responsibilities for the following: a) Obstructing functioning of tender opening executives of DST/GFGNL in receipt/opening of tender bids from prospective Bidders, suppliers/ Contractors. b) Obstructing/ Threatening other prospective bidders i.e. suppliers/ Contractors from entering the tender venue and/ or submitting their tender bid freely.	Banning of business for 3 years which implies Barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST/GFGNL for 3 years from date of issue of banning order.
3	Non-receipt of acceptance of APO/ AWO and SD/ PG by L-1 bidder within time period specified in APO/ AWO.	Forfeiture of EMD and banning of business, including a ban on participation in DST/GFGNL/ tenders, for a period of 1 year from date of issue of banning order.
4.1	Failure to supply and/ or Commission the equipment and /or execution of the work at all even in extended delivery schedules, if granted against PO/ WO.	i) Termination of PO/ WO. ii) Under take purchase/ work at the risk & cost of defaulting vendor. iii) Recover the excess charges if incurred from the PG/ SD and outstanding bills of the defaulting Vendor.

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
4.2	Failure to supply and/ or Commission the equipment and /or execution of the Work in full even in extended delivery schedules, if granted against PO/ WO.	i) Short Closure of PO/ WO to the quantity already received by and/ or commissioned in GFGNL and/or in pipeline provided the same is usable and/or the Vendor promises to make it usable. ii) Under take purchase/ work for balance quantity at the risk & cost of defaulting vendor. iii) Recover the excess charges if incurred from the PG/ SD and outstanding bills of the defaulting Vendor.
5.1	The supplied equipment does not perform satisfactory in the field in accordance with the specifications mentioned in the PO/WO Contract	i) If the material is not at all acceptable, then return the non-acceptable material (or its part) & recover its cost, if paid, from the o/s bills/ PG/ SD. OR ii) If the material is inducted in network & it is not possible to return it and/ or material is acceptable with degraded performance, the purchaser may determine the price for degraded equipment. (Financial penalty = Price – price determined for degraded equipment) himself and/ or through a committee. Undertake recovery of financial penalty from outstanding dues of vendor including PG/ SD.
5.2	Major quality problems (as established by a joint team / committee of User unit(s) and QA package) / performance problems and non-rectification of defects (based on reports of field units and QA package).	i) If the material is not at all acceptable, then return the non-acceptable material (or its part) & recover its cost, if paid, from the o/s bills/PG/ SD; OR ii) If the material is inducted in network & it is not possible to return it and/ or material is acceptable with degraded performance, the purchaser may determine the price for degraded equipment (Financial penalty = Price – price determined for degraded equipment) himself and/ or through a committee. Undertake recovery of financial penalty from

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
		outstanding dues of vendor including PG/ SD; and iii) Withdrawal of TSEC/ IA issued by QA Circle.
6	Submission of claims to GFGNL against a contract (a) for amount already paid by GFGNL. (b) for Quantity in excess of that supplied by Vendor to GFGNL. c) for unit rate and/ or amount higher than that approved by GFGNL for that purchase.	i) Recovery of over payment from the outstanding dues of Vendor including EMD/ PG & SD etc. and by invoking 'Set off' clause mentioned in the RFP or by any other legal tenable manner. ii) Banning of Business for 3 years from date of issue of banning order or till the date of recovery of over payment in full, whichever is later.
Note 5:-	The claims may be submitted with or without collusion of GFGNL Executive/employees.	
Note 6:-	This penalty will be imposed irrespective of the fact that payment is disbursed by GFGNL or not.	
7	Network Security/ Safety/ Privacy:- If the vendor tampers with the hardware, software/ firmware or in any other way that : a) Adversely affects the normal working of GFGNL equipment(s) and/ or any other TSP/ISP through GFGNL. b) Disrupts/Sabotages functioning of the GFGNL network equipment such as Shelter,OFC,Horizontal customer connectivity, village connectivity, BSNL Ph-1 exchanges, Control equipments,Dark fibres, both acive and passive network elements,transmission equipment but not limited to these elements and/ or any other TSP/ISP through GFGNL. c) tampers with the billing related data/invoicing/ account of the Customer/User(s) of GFGNL/Ph-I BSNL and/ or any other TSP(s)/ISPs. d) hacks the account of GFGNL/Ph-I BSNL Customer for unauthorized use i.e. to threaten others/ spread improper news etc. e) undertakes any action that affects/ endangers the security of India.	i) Termination of PO/ WO. ii) Banning of business for 3 years which implies barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by GFGNL/DST for 3 years from date of issue of banning order. iii) Recovery of any loss incurred on this account from the Vendor from its PG/ SD/ O/s bills etc. iv) Legal action will be initiated by GFGNL against the Vendor, if required.

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
8	If the vendor is declared bankrupt or insolvent or its financial position has become unsound and in case of a limited company, if it is wound up or it is liquidated.	(i) Termination/ Short Closure of the PO/ WO. (ii) Settle bills for the quantity received in correct quantity and quality if pending items do not affect working or use of supplied items. (iii) No further supplies are to be accepted except that required to make the already supplied items work. (iv) In case of turnkey projects, If the material is commissioned and is usable without any degradation of performance, then settle bills for the acceptable equipment/ material (or its part) (v) In case of turnkey projects, if the material is inducted in network & it is not possible to return it and/ or material is acceptable with degraded performance, the purchaser may determine the price for degraded equipment (Financial penalty = Price – price determined for degraded equipment) himself and/ or through a committee. (vi) Undertake recovery of financial penalty from outstanding dues of vendor including PG/ SD.
9	In the event of the vendor, its proprietor, Director(s), partner(s) is / are convicted by a Court of Law following prosecution for offences involving moral turpitude in relation to the business dealings with GFGNL/DST.	i) Termination/ Short Closure of the PO/ WO. ii) Settle bills for the material received in correct quantity and quality if pending items do not affect working or use of supplied items. iii) No further supplies are to be accepted except that required to make the already supplied items work. iv) In case of turnkey projects, If the material is commissioned and is usable without any degradation of performance, then settle bills for the acceptable equipment/ material (or its part). v) In case of turnkey projects, If the material is inducted in network & it is not possible to return it and/ or material is acceptable with degraded performance, the purchaser may

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
		determine the price for degraded equipment (Financial penalty = Price – price determined for degraded equipment) himself and/ or through a committee. Undertake recovery of financial penalty from outstanding dues of vendor including PG/ SD.
10	If the vendor does not return/ refuses to return GFGNL's dues:	i) Take action to appoint Arbitrator to adjudicate the dispute.
	a) in spite of order of Arbitrator.	i) Termination of contract, if any. ii) Banning of business for 3 years which implies barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST/GFGNL/ from date of issue of banning order or till the date by which vendor clears the GFGNL's dues,whichever is later. iii) Take legal recourse i.e. filing recovery suite in appropriate court.
	b) in spite of Court Orders.	i) Termination of contract, if any. ii) Banning of business for 3 years which implies barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST/GFGNL/ from date of issue of banning order or till the date by which vendor clears the GFGNL's dues, whichever is later.
11	If the Central Bureau of Investigation/ Independent External Monitor (IEM) / Income and Services Tax / Tax/Goods Custom Departments recommends such a course	Take Action as per the directions of CBI or concerned department.

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
12	The following cases may also be considered for Banning of business: (a) If there is strong justification for believing that the proprietor, manager, MD, Director, partner, employee or representative of the vendor/ supplier has been guilty of malpractices such as bribery, corruption, fraud, substitution of tenders, interpolation, misrepresentation with respect to the contract in question. (b) If the vendor/ supplier fails to execute a contract or fails to execute it satisfactorily beyond the provisions of Para 4.1 & 4.2. (c) If the vendor/ supplier fails to submit required documents/ information, where required. (d) Any other ground which in the opinion of GFGNL is just and proper to order for banning of business dealing with a vendor/ supplier.	i) Banning of business for 3 years which implies Barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST/GFGNL for 3 years from date of issue of banning order.
13	**Conflict Of Interest**: The Bidder shall not engage, directly or indirectly, any ex-employee of the Tendering Authority (within the last 2 years from the date of work order awarded by GFGNL) as a System Integrator (SI), OEM, consultant, advisor, or in any capacity related to this bid/project. The Bidder must submit a self-declaration confirming compliance. Any violation or non-disclosure shall lead to disqualification/termination and possible blacklisting	i) Banning of business for 3 years which implies Barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST/GFGNL for 3 years from date of issue of banning order.

S. No.	Defaults of the bidder / vendor.	Action to be taken
A	B	C
14	**Conflict Of Interest** : The bidder or its associate(Any of the member either SI/OEM) has a close business or family relationship with a staff of the Procuring Organisation who: (i) are directly or indirectly involved in the preparation of the Tender document or specifications of the Tender Process, and/or the evaluation of bids; or (ii) would be involved in the implementation or supervision of resulting Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Procuring Entity throughout the Tender process and execution of the Contract.	i) Banning of business for 3 years which implies Barring further dealing with the vendor for procurement of Goods & Services including participation in future tenders invited by DST/GFGNL for 3 years from date of issue of banning order.
Note 7: The above penalties will be imposed provided it does not clash with the provision of other sections of this tender.		
Note 8:-In case of clash between these guidelines & provision of other sections of this tender, the provision of other sections shall prevail over these guidelines.		
Note 9: Banning of Business dealing order shall not have any effect on the existing/ ongoing works/ Annual Maintenance Contract(AMC) / Comprehensive Annual Maintenance Contract (CAMC) which will continue along with settlement of Bills.		

Table: Appendix-1 Critical Instructions to Bidder

4.68 NON-RELATIONSHIP CERTIFICATE

a. The bidder should give a certificate that none of his/her near relative is working in GFGNL or he may give list of near relatives employed in the GFGNL. In case of proprietorship firm, certificate will be given by the proprietor. For partnership firm, certificate will be given by all the partners. In case of limited company, certificate will be given by all the Directors of the company excluding Government of India/ Financial institution nominees and independent non-Official part time Directors appointed by Govt. of India or the Governor of the state and full time Directors of PSUs, both state and central. In case of consortium all the partners/ directors of consortium shall give non-relationship certificate as above.
b. Due to any breach of these conditions by the company or firm or any other person the tender will be cancelled and bid security will be forfeited at any stage whenever it is noticed and GFGNL will not pay any damage to the company or firm or the concerned person. The company or firm or the person will also be debarred for further participation in the concerned unit.

c. The near relatives for this purpose are defined as: -

i. Members of a Hindu undivided family.
ii. They are husband and wife.
iii. The one is related to the other in the manner as father, mother, son(s) & Son's wife (daughter in law), Daughter(s) and daughter's husband (son in law), brother(s) and brother's wife, sister(s) and sister's husband (brother-in-law).

d. The format of the certificate to be given is "I……..s/o……r/o hereby certify that none of my relative(s) as defined in the tender document is/ are employed in GFGNL unit as per details given in tender document. In case at any stage, it is found that the information given by me is false/ incorrect, GFGNL shall have the absolute right to take any action as deemed fit/without any prior intimation to me."

4.69 TRAINING

a. The bidder shall provide training for supervisory staff of the purchaser or ultimate consignee or DIGITAL BHARAT NIDHI(DBN), DOT free of cost where required for the purpose of Quality and Acceptance Testing.
b. The bidder shall provide training for the functioning of active elements like routers, SNOC elements, RFMS etc.
c. It is the PIA responsibility to deploy right skill manpower for quality of workmanship for FRT, patrollers, O&M field and backoffice staffs including network engineers at SNOC for operations. It is also the responsibility of the PIA to ensure regular preventive and proactive training skill enhancement, network understanding, digital network security and cyber hygiene for field and deployed staff in SNOC in particular.
d. The training session frequency, duration and batch sizes shall be mutually decided so as to meet the actual requirement. It is anticipated that 2 days training for every 1000 GPs per year for first two years and 2 days per 2000 GP per year for subsequent years, should be sufficient. A special cyber hygiene, security and better SNOC operation including service provisioning related training is to be imparted by the PIA every year for 3 days for SNOC and central O&M team without fail. The evidence related to trainings are to be submitted alongwith O&M payment claim of every 4th quarter.
e. The training material including the videos around 100 hour per packages shall be shared by PIA to GFGNL and/or DIGITAL BHARAT NIDHI(DBN) and/or ultimate consignee, for further on line/offline training sessions as per the requirement.
f. The PIA has to arrange the training material, venue and all other arrangements except conveyance and stay arrangement.
g. Periodic training for FRT team should be carried out for better SLA and safety purpose.

4.70 DOCUMENTS REQUIRED FOR CLAIMING PAYMENT

4.70.1 For claiming payment the following documents are to be submitted to the paying authority.

a) Invoices in the name of “Gujarat Fibre Grid Network Limited” or any authority designated by them clearly indicating break up details of composite price i.e. Basic, Goods and Services Tax (GST), any other Duties and Taxes, etc.

b) QA Inspection Certificate of the material used (as applicable).

c) Proof of completion of work (AT certificate).

d) E-waybill as prescribed in the GST law in case of movement of goods (if applicable).

e) Proof of payment of GST, if applicable.

f) Valid submission of applicable MTCTE/ TEC/TSEC with other compliance certificates (should be taken on before execution)

f) Timely uploading of correct and necessary information on GSTN portal is mandatory as prescribed in GST compliances.

Note:-

(1) If the PIA fails to furnish necessary supporting documents i.e. GST invoices in the name of “Gujarat Fibre Grid Network Limited” / Customs invoices etc. and also fails to upload the information on GSTN in respect of the Duties/taxes for which input tax credit is available to the purchaser i.e. GFGNL (as applicable to this tender), the amount pertaining to such Duties/Taxes will be deducted from the payment due to the PIA.

(2) Tax amount will be paid to the PIA only after PIA declares the details of the invoices in its return in GSTR-1 and GSTR-3B uploaded by the PIA and after submission of proofs of GST compliances.

(3) TDS/TCS under Income Tax Act 1961 & GST Acts shall be deducted by GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DOT under DIGITAL BHARAT NIDHI(DBN) PAN/TAN/ GSTIN as a Tax deductor of GFGNL at the prescribed rate, if any (as the case may be).

(4) GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT can adjust/ forfeit Bank Guarantee obtained from the PIA against any loss due to non-compliances towards Tax Laws on account of PIA's default.

(5) In case GFGNL has to pay GST on reverse charge basis, the PIA would not charge GST on its invoices. Further, the PIA undertakes to comply with the provisions of GST law as may be applicable.

4.70.2 No payment will be made for goods/ works/services rejected at the site on testing.

4.70.3 The PIA has to give the mandate for receiving payment costing Rs.5 lakhs and above electronically and the charges, if any, levied by bank has to be borne by the bidder/ PIA. The bidder company is required to give the following information for this purpose:-

a) Beneficiary Bank Name:

b) Beneficiary branch Name:

c) IFSC code of beneficiary Branch:

d) Beneficiary account No.:

e) Branch Serial No.(MICR No.):

4.70.4 GST Invoice:

I. All the details of PIA (name, address, GSTIN/ unregistered supplier, place of supply, SAC/ HSN code etc.) and other mandatory details shall be mentioned on the invoice.
II. Invoice/Supplementary invoice/Debit Note/Credit Note/Receipt Voucher in the name of GFGNL need to be issued in compliant format and timely within the time prescribed under GST law.
III. In case of any deficient/incomplete/rejected supply, GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT shall convey the same in reasonable time to enable the PIA to issue credit note and take tax adjustment.
IV. It would be the responsibility of the PIA to declare correct information on invoice and GSTN portal viz. the amount, the place of supply, rate of tax etc.
V. Registered location of both the parties i.e. GFGNL and PIA should be mentioned with GSTIN No. Further, PIA should raise invoices at the registered premise of GFGNL and ensure that the place of supply as per GST law is same as registered premise of at the premises of its agent GFGNL.
VI. PIA to raise invoices as per the supply location as per GST law.
VII. Invoice number should be mentioned on the e-way bill, if applicable. The E-way bill is to be on the name of which the WO has been awarded (sole bidder or lead bidder in case of consortium).
VIII. PIA shall be responsible for timely issuance and delivery of invoice/ DN/ CN on or before the stipulated time period provided by the GST law.
IX. It is the responsibility of the supplier to ensure that outward supply return (GSTR- 1)would be filed correctly. If not, than cost would be borne by supplier.

a. Reporting of correct outward supply by supplier in the outward return (GSTR-1) is the responsibility of the supplier. In case of mismatch because of supplier's fault, prompt amendments must be made by the supplier else supplier would be required to indemnify GFGNL,/DIGITAL BHARAT NIDHI(DBN), DoT for the loss of credit (if applicable for this tender) due to mis-match. The compliances to be adhered by supplier includes(but is not limited to) the following:

i. Uploading appropriate invoice details on the GSTN portal within the stipulated time;
ii. Issuing GST compliant invoice / CN/ DN in the name of GFGNL should be referred by supplier for capturing information on the invoice.
iii. Supplier needs to pay the entire self-assessed tax on timely basis.
iv. Where invoice is not uploaded or incorrect upload of invoice detail on GSTN portal by supplier then credit on such invoice will be given provisionally subject to matching. So, acceptance of changes made by GFGNL on GSTN on account of non-upload or incorrect upload of invoice details on GSTN is to be submitted by supplier. Such changes w.r.t. the mismatch are required to be accepted by supplier with in the time limit prescribed under the GST law. It should be noted that in case supplier does not accept such changes within the time limit prescribed under GST law, the loss of input tax credit (if any) would be recovered from the supplier. In case of mismatch because of Supplier's fault, prompt amendments must be made by the

supplier else supplier would be required to indemnify GFGNL for the losses of credit and interest paid due to mismatch.

v. Supplier to issue all necessary documentation and perform all necessary compliances to GFGNL.
vi. A self-declaration along with evidence that the bidder is not blacklisted by GST authorities. In case supplier gets black listed during the tenure of this contract, then supplier must indemnify GFGNL,DoT,DIGITAL BHARAT NIDHI(DBN) due to default of supplier.
vii. Where the location agreed are more than one state, then separate invoice state wise shall have to be submitted.
viii. It shall be the responsibility of the supplier to mention place of supply of goods/services in the invoice issued in the name of GFGNL and submitted to designated authority of GFGNL which is acting as a processing/ paying authority on behalf of DIGITAL BHARAT NIDHI(DBN), DoT.

4.71 PRICES

I. The Prices charged by the PIA for the goods delivered and works/services performed under the contract shall not be higher than the prices quoted by the PIA in its Bid except for variation caused by change in taxes as specified in Clause below,
II. For changes in taxes/duties during the scheduled time period, the unit price shall be regulated as under:
    a. Prices will be fixed at the time of issue of purchase/work order as per taxes and statutory duties applicable at that time.
    b. In case of reduction of taxes and other statutory duties during the scheduled time period, purchaser shall take the benefit of decrease in these taxes/ duties for the supplies made from the date of enactment of revised duties/taxes.
    c. In case of increase in duties/taxes during the scheduled time period, the purchaser shall revise the prices as per new duties/taxes for the supplies, to be made during the remaining delivery period as per terms and conditions of the purchase/work order.
III. Any increase in taxes and other statutory duties/ levies, after the expiry of the delivery date shall be to the supplier's account. However, benefit of any decrease in these taxes/duties shall be passed on to the Purchaser by the supplier. The total price is to be adjusted (by reducing the basic price) with increased duties and taxes as per the price mentioned in PO.
IV. The responsibility of the supplier. In case of mismatch because of supplier’s fault, prompt amendments must be made by the supplier else supplier would be required to indemnify GFGNL for the loss of credit (if applicable for this tender) due to mismatch. The compliances to be adhered by supplier includes (but is not limited to) the following:

    a. Uploading appropriate invoice details on the GSTN portal within the stipulated time;
    b. Issuing GST compliant invoice / CN/ DN in the name of GFGNL should be referred by supplier for capturing information on the invoice.

c. Supplier needs to pay the entire self-assessed tax on timely basis.
d. Where invoice is not uploaded or incorrect upload of invoice detail on GSTN portal by supplier then credit on such invoice will be given provisionally subject to matching. So, acceptance of changes made by GFGNL on GSTN on account of non-upload or incorrect upload of invoice details on GSTN is to be submitted by supplier. Such changes w.r.t. the mismatch are required to be accepted by supplier with in the time limit prescribed under the GST law. It should be noted that in case supplier does not accept such changes within the time limit prescribed under GST law, the loss of input tax credit (if any) would be recovered from the supplier. In case of mismatch because of Supplier's fault, prompt amendments must be made by the supplier else supplier would be required to indemnify GFGNL for the losses of credit and interest paid due to mismatch.
e. Supplier to issue all necessary documentation and perform all necessary compliances to GFGNL.
f. A self-declaration along with evidence that the bidder is not blacklisted by GST authorities. In case supplier gets blacklisted during the tenure of this contract, then supplier must indemnify GFGNL due to default of supplier.
g. Where the location agreed are more than one state, then separate invoice state wise shall have to be submitted.
h. It shall be the responsibility of the supplier to mention place of supply of goods/services in the invoice issued in the name of GFGNL.

4.72 CHANGES IN PURCHASE ORDERS

I. GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT may, at any time, by a written order given to PIA, make changes within the general scope of the contract in any one or more of the following:

a. drawings, designs or specifications, where works to be executed under the contract are to be specifically completed as per requirements conveyed by GFGNL.
b. The services to be provided by the PIA.

II. If any such change causes an increase or decrease in the cost of, or the time required for the execution of the contract an equitable adjustment shall be made in the contract price or delivery schedule, or both, and the contract shall accordingly be amended. Any proposal by the supplier for adjustment under this clause must be made within thirty days from the date of the receipt of the change in order.

4.73 SUB-CONTRACTS FOR SERVICES

I. The procurement & supply of material, hiring of machines with or without labor shall not be covered under sub-contracting.

II. Even in such cases, the PIA shall ensure the quality of goods and services as envisaged in this document, with robust mechanism of monitoring and quality check, as the responsibility of contract lies with the PIA. Sub- Contracting, even if approved by GFGNL shall not relieve the PIA from any liability or obligation under the Contract.

III. The PIA shall notify the Tenderer in writing of all subcontracts awarded under this contract if not already specified in its bid. Such notification, in its original bid or later shall not relieve the PIA from any liability or obligation under the Contract. PIA cannot 100% sublet work to one party.

IV. Sub- Contracting to any other agency can be done till layer one only with prior approval of GFGNL (being an agent of DBN, DoT), only up to 70% of the contract value for services {not exceeding 70% CAPEX excluding material cost}.

V. The procurement & supply of material, hiring of machines with or without labour shall not be covered under sub-contracting.

VI. The no. of Subcontractors shall be limited to maximum 15.

VII. There shall be only one level of sub-contracting i.e. the field level sub-contractor, appointed by the PIA shall directly execute the work without further subcontracting the work.

VIII. The Following sub-contracting is strictly not allowed,

1. Placement of Purchase Orders like, all active and passive devices including but not limited to Electronics, UPS, alternate technologies, UBR, FSO, OFC,FDMS, RFMS, duct, rack, etc.
2. Project Leader, Project Management Team, NOC manpower on payroll of PIA.
3. Pilot/Field POC (Proof of Concept)

In event of any deviation to the above, the PIA shall be penalized by deduction of 5% of in every invoice. This penalty provision is considered wilful default and thus it will be over and above the penalty cap limit.

IX. The PIA may sub-contract the following for ease of execution till one level,

1. Trenching & Ducting , OFC laying/blowing, Joint enclosures, route indicators, Splicing, Route mapping GIS tool- videography/photography, and its associated civil works, etc.
2. FRT Team, Patrollers , Fibre laying,
3. Electrical and Electronics components installations & Commissioning.
4. Field Survey and network design by ensuring zero deviation in the implementation during the entire contract duration without impacting other terms and conditions of RFP.
5. Utility management of Shelter Infrastructure.

X. After, the specific approval of Subcontracting of work to any Subcontractor is intimated to GFGNL, the PIA shall further keep GFGNL updated, in writing, whenever, such intimated subcontracts are awarded.

XI. GFGNL/DST/DIGITAL BHARAT NIDHI(DBN)/DoT/DBN has no liability in making payment to subcontractor or field staff. It is the responsibility of PIA to settle all the payables.

XII. The eligibility conditions for the Subcontractors shall be at least ~~50%~~ 30% of the proportionate technical eligibility mentioned in Eligibility Experience Criteria (Sr. No.- 4- OFC Project/ OFC O&M / active elements works of project/O&M) in appendix-A for the proposed subcontracted works other than material supplies. And for shelter infrastructure minimum 100+ shelter with ITC(Installation,testing, commissioning),or maintenance of Shelters /porta cabin to telecom/IP infrastructure provider/Tower Shelter, electrical work, Civil work related with Telecom/IT Site etc.

While according to approval, GFGNL shall evaluate the subcontractor's eligibility based on its technical experience considered against already approved sub-contracts in the same of this project. If such sub-contracted works are completed, the experience can be reconsidered.Even in such cases, the PIA shall ensure the quality of goods and services as envisaged in this document, with robust mechanism of monitoring and quality check, as the responsibility of contract lies with the PIA. Sub- Contracting, even if approved by GFGNL shall not relieve the PIA from any liability or obligation under the Contract.After, the specific approval of subcontracting of work to any subcontractor is approved by GFGNL, the PIA shall further keep GFGNL updated, in writing, whenever, such approved subcontracts are awarded.

XIII. Neither the contractor nor its Subcontractors nor the Personnel shall engage, either directly or indirectly, during the term of this Contract, any business or professional activities in India that would conflict with the activities assigned to them under this Contract and after the termination of this Contract, such other activities as may be stipulated in the contract.

XIV. **No Assignment/ Sub-contracting:** The contractor shall not, save with the previous consent in writing of the Procuring Entity, sublet, transfer, or assign the contract or any part thereof or interest therein or benefit or advantage thereof, in any manner whatsoever.Bidder shall notify the Procuring Entity in writing, all sub-contracts awarded under the contract,if not already stipulated in the contract, in its original bid or later. Such notification shall not relieve the contractor from any of its liability, or obligation under the terms and conditions of the contract. Sub-contract shall be only for bought out items and incidental Works/Services. Sub-contracts must comply with and should not circumvent Contractor's compliance with its obligations. If the Contractor sublets or assigns the contract or any part thereof without such permission, the Procuring Entity shall be entitled, and it shall be lawful on his part, to treat it as a breach of contract and avail any or all remedies thereunder.

4.74 RISK PURCHASE

i) If the selected Bidder fails to perform its obligations (or any part thereof) under this scope of this RFP or if the scope of this RFP is terminated by the Tenderer due to breach of any obligations of

the selected Bidder under scope of this RFP, the tenderer reserves the right to procure the same or equivalent Hardware / Services / Deliverables from other sources as per options mentioned below.

1. from L2 / L3 /…Ln Bidder (where n is the total number of bids received) with the first Bidder out of L2 / L3 /…Ln who agrees to match the price of L1 discovered rate.
2. from any other “alternate source”. The procurement from “alternate source” shall be done, as far as possible, through Government’s procurement guidelines as deemed appropriate by the tenderer.

i) Above mentioned procurement will be done at the selected Bidder’s (who has failed to perform its obligations & thus defaulted) risk, cost and responsibility. Any incremental cost borne by the Tenderer in procuring such Hardware / Services/ Softwares / Deliverables shall be borne by the selected Bidder (who has failed to perform its obligations & thus defaulted). Any such incremental cost incurred in the procurement of such Hardware / Services / Deliverables from other source will be recovered from the pending due and payable Payments / Security Deposit / Bank Guarantee provided by the selected Bidder (defaulted Bidder) under this scope of this RFP and if the value of the Hardware / Services / Deliverables under risk purchase exceeds the amount of pending payable payments / Security Deposit and / or Bank Guarantee, the same may be recovered, if necessary, by due legal process. The procurement from alternate source shall be done, as far as possible, through Government’s procurement guidelines as deemed appropriate by the tenderer.

In this case of risk purchase, L2 / L3 /…Ln Bidder or any alternate source will have to submit performance bank guarantee @ 5% of the total value of the work allotted to the Bidder as per performance bank guarantee clause criteria or as per the terms and conditions mentioned in the tender.

4.75 DELAYS IN THE CONTRACTOR'S PERFORMANCE

4.75.1 Performance of the services shall be made by the PIA in accordance with the time schedule specified in the purchase order/ work order.

(a) In case the works are not completed in the stipulated period, as indicated in the Purchase Order/ work order, GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT reserves the right either to short-close/ cancel the purchase order/ work order and/ or recover penalty.
(b) Before taking such action of short-closure/ cancellation of purchase order/ work order, GFGNL shall serve, four (04) written notices of default, to the PIA at an interval of ten(10) days after each notice.
(c) If the PIA does not remedy its failure within a period of 10 days after 4th notice, GFGNL may take action as mentioned in the relevant clause of RFP.
(d) The cancellation/ short-closing of the order shall be at the risk and cost of the PIA and GFGNL reserves the right to give work order for the balance works at the risk and cost of the defaulting PIA within one year from the date of short closure of the Purchase Order/ Work Order OR date of

scheduled completion of the respective project phase (i.e. construction or O&M), whichever is later.

4.75.2 Delay by the PIA in the performance of its works obligations shall render the PIA liable to any or all of the following sanctions:

(a) forfeiture of its performance security,
(b) imposition of penalty, and/ or
(c) Short- closure of the contract in part or full and/ or termination of the contract for default.

4.75.3 If at any time during the performance of the contract, the PIA encounters condition impending timely performance of service (execution of work), the PIA shall:

(a) Promptly notify to GFGNL in writing the fact of the delay, effect on SLAs and its likely duration and its cause(s). As soon as practicable after receipt of the PIA's notice, GFGNL shall evaluate the situation and may at its discretion extend the period for performance of the contract(by not more than 04 weeks or as per provisions in respected clause of RFP) or grant relaxation in SLAs as per provision given below :

(b) If the work is not completed as per the milestone, applicable penalties/ LD shall be levied. However, the PIA need not seek delivery period extension till the delay of 10 weeks from the milestone. PIA shall request for delivery period extension, Work Order wise, after delay of 10 weeks as per project milestones. However, GFGNL reserves the right to short close any time beyond delivery period. The PIA has to submit their request for extension in time along with the undertaking as per clause mentioned in RFP certificate at least two weeks before the expiry of time period. The PIA shall also submit unconditional acceptance of the conditions for time period extension i.e. applicability of penalties, prices to be provisional and to be regulated and submission of additional BG, wherever applicable. The decision regarding extension shall be communicated within four weeks of the receipt of request and after receipt of the unconditional acceptance and the undertaking mentioned above.

(c) In case extension is being granted beyond 04 weeks then the PIA shall submit additional BG while seeking extension. For piecemeal works the amount of additional BG shall be 5% of the value of balance quantity of works to be done for which extension in time period has been sought. The additional BG shall be valid for six months beyond extension of scheduled period sought and shall be discharged after the works has been completed and made over to the ultimate consignee within the last extended scheduled period on submission of inspection certificate from designated officer’s receipt without prejudice to the other remedies available to GFGNL.

4.75.4 If the works are not completed in the extended time period, the purchase/work order shall be short-closed and both the Performance securities i.e. PBG and additional BG shall be forfeited. The decision of GFGNL shall be final.

4.76 INCIDENTAL SERVICES

The PIA/supplier may be required to provide any or all of the following services:

(a) Performance or supervision of on-site assembly and/ or start-up of the supplied Goods;

(b) Furnishing of tools required for assembly and/ or maintenance of supplied Goods;

(c) Performance of supervision or maintenance and/ or repair of the supplied Goods, for a period of time agreed by the parties provided that this service shall not relieve the supplier of any warranty obligations under this contract.

ANNEXURE A CONCILIATION THROUGH OUTSIDE EXPERT COMMITTEE (OEC)

i. If any dispute, difference, question or disagreement arises between the parties hereto or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the third party contract or breach thereof which parties are unable to settle mutually, the same may first be referred to conciliation through Outside Expert Committee ("OEC") as provided in the Conduct of Proceedings through OEC in *Annexure B* below.

ii. The venue of the OEC meeting shall be as decided by DIGITAL BHARAT NIDHI(DBN)/ GFGNL.

iii. OEC members will be paid fees and provided facilities as per prevalent guidelines.

iv. Parties are free to terminate the conciliation proceedings at any stage as provided under the Arbitration and Conciliation Act, 1996.

v. Subject to terms and conditions contained in the above paras, the provisions of the Part III of Arbitration and Conciliation Act, 1996 shall be applicable to the conciliation proceedings and the parties and the OEC members shall be bound by the same.

ANNEXURE B CONDUCT OF CONCILIATION PROCEEDINGS BY OEC

I. Proposal for OEC

The Claimant shall give notice for conciliation to the other parties. The notice shall be given to the concerned officer(s) named for the other parties in the third-party contract, clearly bringing out the points of dispute and the amount claimed with documents in support of the claim and the party concerned shall not raise any issue thereafter. It shall be ensured by parties that no parallel proceedings relating to dispute under the same contract are going on in any Court/ Forum /Tribunal. In case, if any dispute is pending relating to the same Contract, then both the parties shall either withdraw the proceedings from the Court/ Tribunal / forum or shall keep the case in abeyance.

II. Constitution of OEC

a. The OEC shall comprise of atleast 3 members, appointed by DIGITAL BHARAT NIDHI(DBN)/ GFGNL.

b. In case of vacancy created because of the resignation/recusal of any member, or if any OEC member is not available to attend further OEC Meetings, the vacancy shall be filled by the nomination by the DIGITAL BHARAT NIDHI(DBN)/ GFGNL.

c. The OEC members shall give a declaration of independence and impartiality (as per Appendix) to both the parties before the commencement of the OEC proceedings.

III. Constitution of OEC

a. The claimant shall submit its statement of claims to OEC members, and to the other party(ies) (hereinafter referred as “Respondents”) prescribed in the appointment letter within 30 days of the issue of the appointment letter (as per Appendix, placed below clause 21).

b. The respondents shall file its reply and counter claim (if any) within 30 days of the receipt of the statement of claims.

c. Parties may file their rejoinder/additional documents if any in support of their claim/counter claim within next 15 days. No documents shall be allowed thereafter, except with the permission of OEC.

d. OEC will commence its meetings only after completion of the pleadings.

e. In case of 3 members OEC, 2 members will constitute a valid quorum and the meeting can take place to proceed in the matter after seeking consent from the member who is not available. However, OEC Recommendations will be signed by all Members. Further, efforts must be made for unanimous recommendations. In exceptional circumstances such as death/serious illness of OEC member or if any OEC member has resigned/recused himself from the case during OEC proceedings and non-appointment of any other member in the place of vacancy so caused, then with the consent of all the parties, two OEC members shall give and sign the recommendations. At the conclusion of OEC proceedings, OEC members shall give its recommendations for resolution of disputes based on material before it with proper justification and reasons. Failure report or recommendations without reasons shall not be construed to be a recommendation by the OEC.

f. The parties shall be represented by their in-house employees/executives. No party shall be allowed to bring any advocate or outside consultant/advisor/ agent to contest on their behalf. Ex-officers of GFGNL and/or DIGITAL BHARAT NIDHI(DBN) who have handled the matter in any capacity are not be allowed to attend and present the case before OEC on behalf of Contractor.

g. Solicitation or any attempt to bring influence of any kind on either OEC Members or GFGNL or DIGITAL BHARAT NIDHI(DBN) is completely prohibited in conciliation proceedings and DIGITAL BHARAT NIDHI(DBN)/ GFGNL reserves the absolute right to close the conciliation proceedings at their joint discretion if they apprehends any kind of such attempt made by the Contractor or its representatives.

h. Parties agree to rely only upon documentary evidence in support of their claims and not to bring any oral evidence in the OEC proceedings.

i. OEC will give full opportunity of hearing to the parties before giving its recommendations.

j. OEC will conclude its proceedings in generally 4 meetings, and give its recommendations within 60 days of its first meeting. OEC will give its recommendations to all the parties recommending possible terms of settlement. DIGITAL BHARAT NIDHI(DBN)/ GFGNL may extend the time/ number of meetings, in exceptional cases, if OEC requests for the same with sufficient reasons.

k. Parties shall not claim any interest on claims/counterclaims from the date of notice invoking conciliation till execution of settlement agreement, if so arrived at. In case, parties are unable to reach a settlement, no interest shall be claimed by either party for the period from the date of notice invoking conciliation till the date of OEC recommendations and 30 days thereafter in any further proceeding.

IV. Actions after OEC Recommendations

a) The recommendations of OEC are non-binding and the parties may decide to accept or not to accept the same. Parties are at liberty to accept the OEC recommendation with any modification they may deem fit.

b) Each party shall communicate its comments/response on the Recommendations given by the OEC along with its decisions whether the recommendations are acceptable or not, to the other parties within a period of 15 days from the electronic receipt of the recommendations of OEC. If recommendations are acceptable by all the parties, a settlement agreement under Section 73 of the Arbitration and Conciliation Act, 1996 will be signed within 15 days of last communication of the period ending 15 days within which the decision of the parties has to be communicated, and same shall be authenticated by all the OEC Members. The Agreement so signed and authenticated shall have the same effect as an award passed under Section 30 of the Arbitration and Conciliation Act, 1996.

c) The timelines mentioned in the above guidelines are with an objective to achieve expeditious conclusion of OEC proceedings. However, it does not mean that any action beyond the timelines will be invalid. However, the party concerned will make all efforts to complete the actions within the stipulated time.

d) The parties shall keep confidential all matters relating to the conciliation proceedings including minutes of OEC meeting and Recommendations of OEC. Parties shall not rely upon them as evidence in any arbitration / court proceeding whether or not such proceedings relate to the dispute that is the subject of the conciliation proceedings, views expressed or suggestions made by the other party in respect of a possible settlement of the dispute;

i. admissions made by the other party in the course of the OEC proceedings.

ii. proposals made by the OEC.

iii. the fact that the other party had indicated his willingness to accept a proposal for settlement made by the OEC.

e) Confidentiality extends also to the settlement agreement, except where its disclosure is necessary for purposes of implementation and enforcement. This stipulation will not apply to disclosure made by GFGNL or DIGITAL BHARAT NIDHI(DBN) to Govt. of India or its authorities, if required.

f) The OEC members shall be entitled to the Fee as applicable.

APPENDIX: DECLARATION OF INDEPENDENCE AND IMPARTIALITY BY OEC MEMBER

To,

1. GFGNL
2. DIGITAL BHARAT NIDHI(DBN)
3. Contractor(PIA)

Subject: Declaration of independence and impartiality by Outside Expert Committee (OEC) Member in the dispute under Contract No _.

I, the undersigned, hereby accept to act as Member of the Expert Committee and conciliate in the disputes under reference between the parties above named, I confirm that I am aware of the requirements of law particularly of the Arbitration and Conciliation Act, 1996, to act as a conciliator, I am able to act as conciliator and am available to act as Member of the Expert Committee, I hereby declare that I am independent of each of the parties and have no ownership interest in any part of the contract under reference or any financial interest in the said contract. I have no interest in the outcome of the dispute or its settlement.

I hereby affirm that I shall act with honesty, integrity, diligence, and will remain independent and impartial while discharging my duties as conciliator/OEC Member. I will disclose any interest or relationship with the parties or the subject matter which might compromise in any manner my ability or capacity to remain impartial and independent in the matter.

I further, being a member of the OEC, agree to abide by the terms and conditions of Clause and conduct the proceedings as per Clauseof the Contract/Agreement No. .

(Signature) Name:
Address:
Phone:
Email:
Date:

4.77 PUBLIC PROCUREMENTS- MAKE IN INDIA (MII)

a. In accordance to guidelines of GoI issued vide No. P-45021/2/2017-PP (B.E.-II)-Part IV (Vol-II) dated 19.07.2024 and Department of Telecommunications Gazette notification dated **21.10.2024** along with instructions as amended from time to time by Govt. of India, in order to encourage make in India and promote manufacturing and production of goods and services in India, preference will be given to domestically manufactured equipment envisaged to be procured through this tender. A copy of the aforesaid Notifications/ Guidelines/ Amendments can be downloaded from Department of Promotion of Industry and Internal Trade website i.e. URL www.dipp.gov.in . Purchase preference for domestic manufacturer, methodology of its implementation, value addition to be achieved by domestic manufacturers, self-certification and compliance and monitoring shall be as per the aforesaid Guidelines/ Notifications. The Guidelines may be treated as an integral part of the tender document.
   Submission of self-certification for Local Content at the time of bidding shall be mandatory, as per the prescribed formats in the RFP.
   The requirement of certificate from statutory auditor/cost auditor shall be applicable as per prevailing GoI guidelines at the relevant stage (award/execution).
   Bidders shall ensure full compliance with the latest amendments/notifications, and furnish supporting certifications/documents as required during the project lifecycle.
b. As per aforementioned guidelines there shall be three categories for manufacturers/ suppliers:
   I. Class-I Local Supplier: A supplier or service provider whose goods, services or works offered for procurement meets minimum 'Local Content' of 50%.
   II. Class-II Local Supplier: A supplier or service provider whose goods, services and works offered for procurement meets minimum 'Local Content' of 20% but less than 50%.
   III. Non-Local Supplier: A supplier or service provider whose goods, services and works offered for procurement has 'Local Content' less than 20%.
c. The Local Content shall mean the amount of value added in India which shall be the total value of item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, in percent. DPIIT letter dated 16.09.2020 & 04.03.2021 shall be referred for calculation of Local Content of bid.
d. Class-I & Class-II local and non-local bidders shall be eligible to participate in the tender. However, Preference shall be given to Class-I bidders as defined in the Public Procurement (Preference to Make in India) Order, 2017, as amended from time to time.
e. The bidder must source notified items mandatorily from Class-I local suppliers. The overall local content of bid shall be calculated as per Clause 2(e) of the DPIIT PPP-MII order, which states: "For contracts involving the supply of multiple items, the weighted average of all items shall be taken while calculating the local content.

f. The bidder shall submit **Form-1(as per Annexure-format XXI)** for overall local content of the total bid, along with declaration specifying the local content of individual SOR items, failing which the bid is liable to be rejected. The declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the bidder is a company and by a practicing cost accountant or a chartered accountant for bidders other than companies.

g. At the time of bidding, the bidder is required to submit only a self-declaration regarding the local content of their products without disclosing the details mentioned in points (vi) to (xiii) of Form-I. These details must be maintained by the bidder in accordance with the conditions outlined in the DoT/DPIIT PPP-MII notification/order, as amended from time to time.

h. The provisions of the Public Procurement (Preference to Make in India) Order 2017 dated June 15, 2017 (29th August 2018, 21st October 2024 or subsequent revisions, if any) by Department of Industrial Policy and Promotion, GoI shall apply to this tender to the extent feasible. However, the participation is open to all i.e. Class-I, Class-II and to Non-local suppliers.

i. For award of work, preference will be given to Class-I Local category bids based on declaration submitted by the respective bidders. Since work for any package is indivisible, the award of work will be governed as per para 3A (c) of DPIIT guidelines dated 16.09.2020, cited above.

j. It is mandatory for the bidder to submit a self-certification as per proforma in Annexure and an undertaking in Annexure format, along with the bid that the items (Excluding Services (I&C) and AMC value) offered in this tender meets the minimum local content and shall give details of the locations at which the local value addition is made. In addition, such bidder is also required to provide a certificate from the statutory auditor or cost auditor of the company giving the percentage of local content in accordance to DPIIT letter dated 16.09.2020 & 04.03.2021. Furnishing of false information on this account shall attract penal provisions as per the Guidelines/Notification. Bidders may note that whereas GFGNL may at its discretion choose to randomly verify any of the documents submitted towards fulfilment of claims of PMI under this clause, it is under no obligation to verify the self-declaration of bidder and/or certificate of Chartered Accountant/Cost Accountant regarding the bidder meeting the criteria to be eligible for class I / class II status in this tender. Acceptance of the documents furnished by the bidder as part of the bid by GFGNL in this regard shall not amount to endorsement of their content by GFGNL, and consequences of false declarations if any, discovered at any stage before or after award of work shall completely fall on the bidder.

k. All instructions/ amendments on the subject of PMI issued by DPIIT or any other department of Government of India, up to the date of bid shall be applicable for this tender, and bidders claiming any benefits under subject provisions must ensure full compliance by furnishing the necessary documents, beyond the list of documents mentioned in this tender.

l. No relaxation in this shall be given and any delay in achieving the milestone shall attract penalties as per the provision of the tender.

m. The PIA shall submit the Field Trial test schedule; covering all the technical specifications as per the tender; to GFGNL for approval.

n. The TSEC and field trial shall not absolve the PIA for offering the individual equipment for acceptance testing after installation.
o. Being a turn-key project, the responsibility of the PIA shall be to meet all the performance parameters, functional requirements and SLA benchmarks during the entire contract period. In case, the router or any other equipment does not meet these requirements during Acceptance Testing and/ or O&M period, the PIA shall be bound to replace such equipment with appropriate equipment meeting all the requirements specified in the tender for entire contract period on its own cost.
p. Any bidder from a country which shares land border with India will be eligible to bid if the bidder is registered with the competent authority as specified in the annexure of O.M. No. 7/10/2021-PPD(1) Dated 23.02.2023 from Department of Expenditure, Ministry of Finance. The bidders shall submit an undertaking in this regard as per format provided, of this tender document.
q. The Mandatory Testing and Certification of Telecom Equipment (MTCTE) guidelines require that every telecom equipment must undergo mandatory testing and certification prior to sale, import of use in India.
r. The supplied products under this project shall meet the extant guidelines on MTCTE issued by TEC from time to time for various telecom equipment.
s. The instructions regarding supply of 'Trusted products' as mandated by DoT vide File no- 20-271/2010 AS-I (Vol-III) dated 10.3.2021, along with its amendments, issued from time to time, shall have to be complied for this tender. The bidder/ OEM shall not be in the notified list of designated sources, from whom no procurement can be done, as per above letter.
t. Routers and RFMS, to be supplied under this tender, should comply "Trusted Products" before delivery. In case, the make/ model is not approved as "Trusted Product", then, the bidder/ OEM shall obtain the approval for the tendered products from the designated office.
u. Alternatively, the bidders can provide all documents/ information to GFGNL for application on trusted portal, in their technical bid. The format for submission of information (to be submitted with technical bid) is enclosed.
v. In case of imported products, OEM should have a registered office and Service Support Centre in India to provide after sales service support in India.
w. The bidder is required to submit a certificate to this effect, as part of its bid.

4.78 CONDITIONS FOR FIELD TRIAL OF THE CLASS I/ CLASS II LOCAL SUPPLIERS FOR ROUTERS;

I. The offered Make-Model for Block Router and GP Routers can be from same OEM or different OEM. However, the same or its earlier version should have been supplied for minimum 30% of required quantities for each relevant line item under the financial bid Line Items 4(a), 4(b), and 4(c)."
II. In case of Class-I & Class-II local suppliers (as per prevalent DPIIT, GoI guidelines mentioned in tender), the offered Make-Model for Each Block Router and each GP Routers or its earlier version

should have been supplied for minimum 10% of required quantities.

III. In case, a bidder quotes a router model (OEM-1) of a Class I/ II local supplier (as defined in the DPIIT guidelines mentioned), which does not meet the criteria as defined above, it must also quote another model (OEM-2) of some other OEM meeting the above required criteria.

IV. The PIA shall have to offer the router model (OEM-1) for field trial to GFGNL within **30** days of the WO/APO/AWO date. The Field trial is mandatory and must be successfully completed within **90** days of the WO/APO/AWO date.

V. The Field trial shall consist of one ring in a block with Router and minimum 6 to 7 GP routers at GP rings. The other ring shall be in different block router at the Block and minimum 6 to 7 GPs with mix of Category C and Category D routers at GP. Logical ring shall be created using multiple fibres on the same route, if a physical ring is not possible.

VI. In case, the Field trial for any category is not completed successfully within **90** calendar days of the WO/APO/AWO, the PIA must provide all the routers from OEM-2 for that category.

VII. No relaxation in this shall be given and any delay in achieving the milestone shall attract penalties as per the provision of the tender.

VIII. The PIA shall submit the Field Trial test schedule; covering all the technical specifications as per the tender; to GFGNL for approval.

IX. The TSEC and field trial shall not absolve the PIA for offering the individual equipment for acceptance testing after installation.

X. Being a turn-key project, the responsibility of the PIA shall be to meet all the performance parameters, functional requirements and SLA benchmarks during the entire contract period.

XI. In case, the router or any other equipment does not meet these requirements during acceptance testing and/ or O&M period, the PIA shall be bound to replace such equipment with appropriate equipment meeting all the requirements specified in the tender for entire contract period on its own cost.

XII. Any bidder from a country which shares land border with India will be eligible to bid if the bidder is registered with the competent authority as specified in Annexure-I of O.M. No. 7/10/2021-PPD(1) Dated 23.02.2023 from Department of Expenditure, Ministry of Finance. The bidders shall submit an undertaking in this regard as per format provided at **section 9.15(Annexure XV)**, of this tender document.

XIII. The Mandatory Testing and Certification of Telecom Equipment (MTCTE) guidelines require that every telecom equipment must undergo mandatory testing and certification prior to sale, import of use in India.

XIV. The supplied products under this project shall meet the extant guidelines on MTCTE issued by TEC from time to time for various telecom equipment.

XV. The instructions regarding supply of ‘Trusted products’ as mandated by DoT vide File no-20-271/2010 AS-I (Vol-III) dated 10.3.2021, along with its amendments, issued from time to time, shall have to be complied for this tender. The bidder/ OEM shall not be in the notified list of designated sources, from whom no procurement can be done, as per above letter.

XVI. Routers and RFMS, to be supplied under this tender, should comply “Trusted Products” before delivery.

XVII. In case, the make/ model is not approved as “Trusted Product”, then, the bidder/ OEM shall obtain the approval for the tendered products from the designated office.Alternatively, the bidders can provide all documents/ information to GFGNL for application on trusted portal, in their technical bid. The format for submission of information (to be submitted with technical bid) is enclosed at Annexure-XXVI (section 9.26)

XVIII. In case of imported products, OEM should have a registered office and Service Support Centre in India to provide after sales service support in India. The bidder is required to submit a certificate to this effect, as part of its bid.

4.79 SUSPENSION OF WORK

1. The PIA shall, if ordered in writing by the Tenderer’s Representative, temporarily suspend the works or any part thereof for such a period and such a time as ordered, then PIA shall not be entitled to claim compensation for any loss or damage sustained by him by reason of temporary suspension of the Works as aforesaid but shall be eligible for the payment (of products/services delivered and accepted) during the suspension period as per contract. An extension of time for completion, corresponding with the delay caused by any such suspension of the works as aforesaid shall be granted to the PIA, if request for same is made and that the suspension was not consequent to any default or failure on the part of the PIA. Both PIA and Tenderer acknowledges the suspension of work by Tenderer, if results in extension of contract, the extra cost shall be on account of Tenderer which shall be mutually agreed. In case the suspension of works, is not consequent to any default or failure on the part of the PIA, and lasts for a period of more than 2 months, the Bidder shall have the option to request the Tenderer to terminate the Contract with mutual consent.
2. In the event that the Purchaser suspends the progress of work for any reason not attributable to the PIA for a period in excess of 30 days in aggregate, rendering the PIA to extend his Bank Guarantee then Purchaser shall bear only the cost of extension of such bank guarantee for such extended period restricted to the normal bank rates as applicable in the international banking procedures subject to the PIA producing the requisite evidence from the bank concerned.

SECTION-5 SCOPE OF WORK

5.1 SCOPE OF WORK

i) The PIA Selected through this bid,is responsible for delivering a fully operational network, adhering to performance, scalability, and regulatory standards. This approach ensures seamless integration of technology, supporting voice, data and enterprise services. Gujarat BharatNet Phase-III project encompass both greenfield and brownfield developments, focusing on the deployment of cutting-edge network solutions while also upgrading existing infrastructure to meet future demands. The PIA assumes full responsibility for the project's execution, ensuring timey delivery, cost efficiency, and network performance to meet service-level-agreements (SLAs) and customer needs in a rapidly evolving digital landscape.

The PIA selected through this bid is responsible for survey, design, construction, upgradation and O&M- (DBOM- Design, build , Operate and Maintain) of the network.

To implement the ABP in Gujarat the Broad level scope of work would involve following,

a) Construction: To build network infrastructure across remaining Gram Panchayats (GPs), to establish the IP-MPLS network ,and on demand Revenue-Villages.

b) Upgradation: To upgrade the existing network infrastructure from linear to IP-MPLS based ring topology across GPs and Sub-Block sites.

c) Implementation of IP-MPLS Network: To deploy the IP-MPLS network for GFGNL on behalf of DBN,DoT under the BharatNet program across the state.

d) Operation and Maintenance (O&M): To operate and maintain both the existing and the newly deployed network infrastructure as per the defined SLA.

e) Establishment and Upgrade of State Network Operation Center (NOC): GFGNL has already having it's own NOC infrastructure, However, PIA selected through this bidding process will be solely responsible to upgrade the infrastructure including the software and hardware scope mentioned in this RFP and to connect the complete network of existing and to be install or to be maintain by the PIA for monitoring, supervision and O&M to meet the SLAs. All inventories for bharatnet project including GPs, Revenue Villages, etc. with their all active infrastructure are to be connected to Centralized location,i.e., SDC/ SNOC/GFGNL's desired location.

f) Shelter Infrastructure:

To upgrade the existing shelter infrastructure across the ABP Project in Gujarat alongwith the operation maintenance of the shelter infrastructure (active and passive) will be in the scope of selected PIA. For the sub-block infrastructure, the priorirty of housing equipment for Phase-I will be in the BSNL telephone exchange , however, based on GFGNL/IE approval the scope of establishing new shelter as per the terms and conditions mentioned in the RFP shall be in the selected PIA's scope.

g) Network and Service Provisioning: To enable retail, enterprise and wholesale services as per the requirement of GFGNL across state during the entire Contract duration. To provide comprehensive network monitoring and service provisioning to enable retail, enterprise and wholesale services as per the requirement of GFGNL across the Contract duration.

Selected PIA shall provide EMS with 1+1 failover configuration.EMS Client to be compatible with all major browsers. The PIA/OEM are responsible to create, operat and maintain the SNOC infrastructure including expose API(wherever asked by the tenderer) and do necessary exchange of standard parameters to fulfill technology led network governance through the S-NOC/ C-NOC. From Master-Block to SDC/SNOC GFGNL shall arrange the ILL/P2P(out of scope for PIA), however,PIA has to support for network provisioning of Internet Lease line/P2P bandwidth at SDC, master block or Sub-blocks to carry Gram Panchayats as well as GFGNL's customer traffic up to State capital. SFP/XFP/any pluggable required at the service provider's equipment shall be managed by service provider identified by GFGNL.

h) **Unified Network & Service Framework**: The existing Data Center /State Network Operations Center of BharatNet network including the infrastructure created for connecting all the government institutions/organisations etc., with the Gujarat Phase-I and II along with the infrastructure created to establish a unified, centrally managed operational framework. The integrated environment shall enable consolidated OSS and BSS operations, unified NMS visibility, SLA driven O&M and seamless provisioning and management of services like FTTH, IBB, ILL, P2P leased lines, MPLS VPN and other future service expansions. The end-to-end unified network architecture shall be comprehensively planned, implemented, tested, demonstrated and commissioned to GFGNL, ensuring that the complete infrastructure function as a single cohesive network to support future retail, enterprise business expansion throughout the contract period.

i) The scope of work for the Project Implementation Agency (PIA) shall cover across the state of Gujarat and it is to be noted that number of Gram Panchayats (GPs) as indicative in below table, and PIA shall undertake the Scope of Work across all Gram Panchayats (GPs) identified post survey and approved by GFGNL.

S. No.	Item Description	Unit	Ph-I	Ph-2	Total Quantity (GJ)
1.1	No. Of Sub-Block	Nos	255	383	638
1.2	**No. of GPs**	**Nos**	**6592**	**8145**	**14737**
1.2a	No. of GPs for creation	Nos	163	345	508
1.2b	No. of GPs for upgradation	Nos	6429	7800	14229
1.3	No. of Villages for last mile connectivity	Nos	1693	2448	4141
1.4	No. Of Blocks	Nos	114	148	262
1.5	No. Of Districts	Nos	11	23	34
1.6	No. Of strategic locations	Nos	162	323	485

Note: Above figures are tentative in nature as per present status.The figures provided above are for indicative purposes only and are based on the current status. These may vary due to changes in geopolitical boundaries, field counts, or other relevant factors. The selected Project Implementation Agency (PIA) shall be responsible for delivering the complete scope of work, irrespective of such variations.

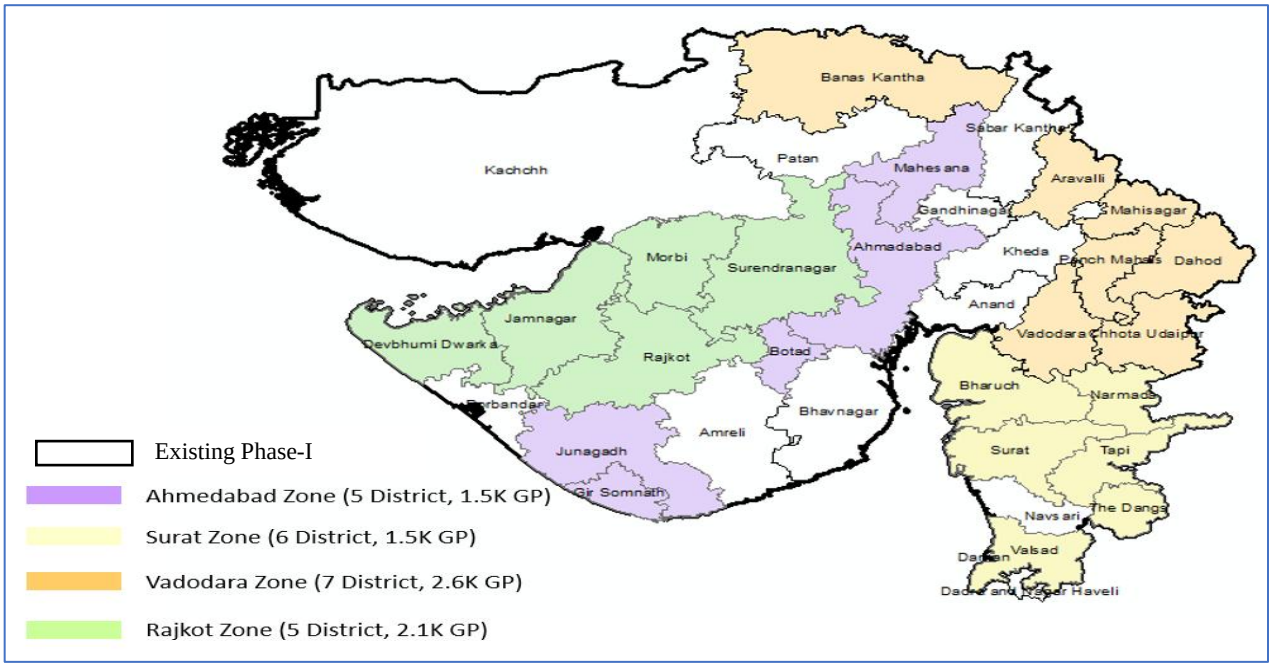
5.2DETAILED SCOPE OF WORK

i. Historical Details:

a) BBNL has implemented BharatNet Phase-I in **11 districts** (Gandhinagar, Kheda, Anand, Navsari, Bhavnagar, Amreli, Sabarkantha, Patan, Kachchh, Porbandar, chota udepur) and has implemented in partial talukas of 4 districts (Bharuch, Vadodara, Valsad and Mehsana).

b) GFGNL has implemented BharatNet Phase-II in **18 districts** (Ahmedabad, Surendranagar, Botad, Morbi, Rajkot, Jamnagar, Junagadh, Gir Somnath, Devbhumi Dwarka, Banaskantha, Arvalli, Mahisagar, Panchmahal, Dahod, Narmada, Surat, Tapi, Dang) and has implemented in incomplete talukas of **4 districts** (Bharuch, Vadodara, Valsad and Mehsana) from Phase-I. GFGNL has implemented BharatNet Phase – II network in Gujarat in two different packages. Package – A has three islands in Rest of Gujarat and Package – B has one island in Saurashtra region. Package – A has 12 districts & Package – B has 10 districts. Further, both the packages are divided into two zones. Package A has two zones i.e., Vadodara zone & Surat zone and Package B has two zones i.e., Ahmedabad zone & Rajkot zone.

Existing BharatNet Phase-I & II coverage:



Note –
i) Mentioned GP counts are approximate numbers, white color marked districts are of BharatNet Phase-I and BharatNet Phase-II districts are divided into four zones marked on above map.
ii) Details for geographical historical boundaries wise counts of existing Phase-I & Phase-II are available in annexure-G

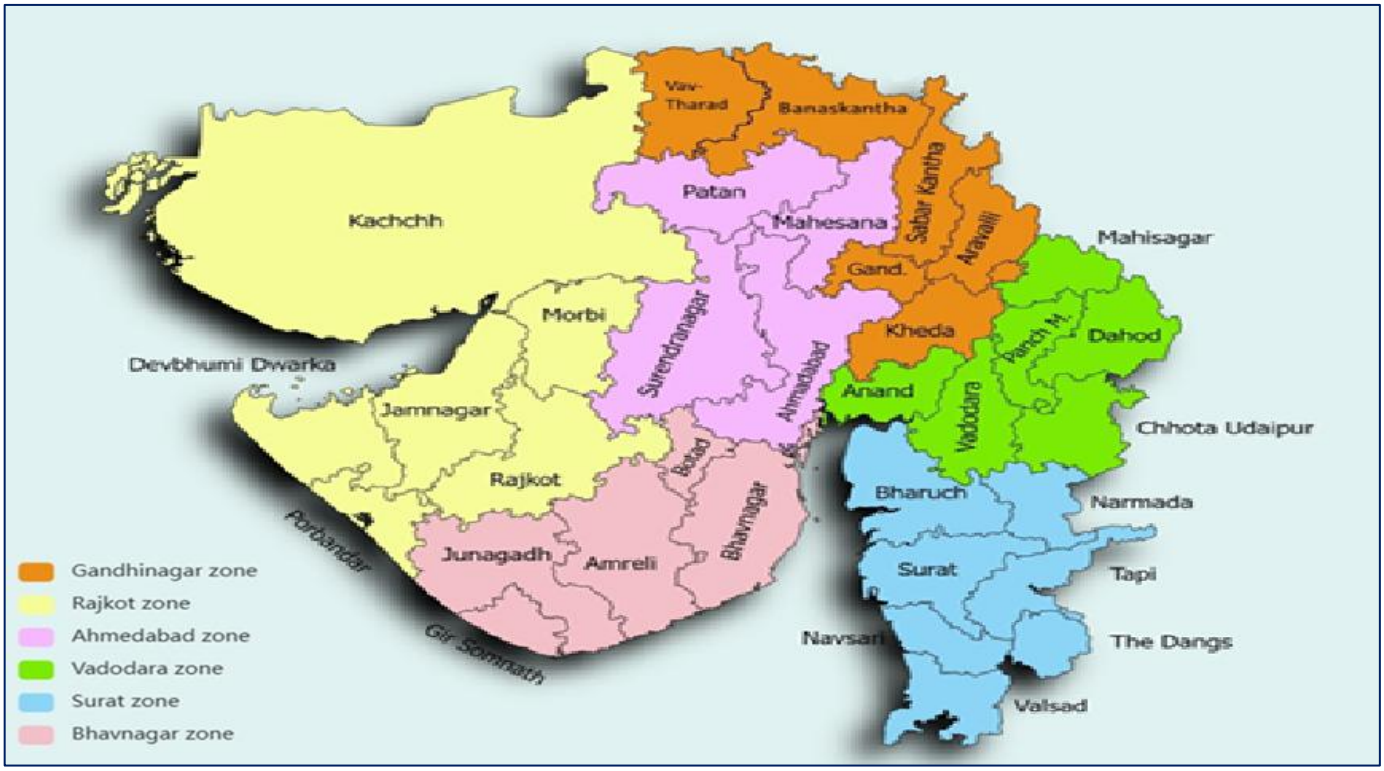
ii. ABP-Gujarat (BharatNet Phase-III):

a) The new scope of work includes,

- Creation of IP-MPLS ring network of non-connected GPs with existing Phase-I and Phase-II infrastrtuctre. (Ref. 9.31 - Annexure – XXXI)
- Upgradation of OFC network from linear to ring topology of existing Phase-I and Phase-II GPs with IP-MPLS technology. (Ref. 9.32 - Annexure – XXXII)
- Revenue Village connectivity beyond GPs **on demand** by tenderer for revenue villages on linear OFC connectivity from GP. Here, "*On demand*", meaning, villages which have minimum demand for 5 home fiber connections registered on BNU portal/as per the information provided by the state. (Ref. 9.35 - Annexure – XXXV)
- O&M for 10 years including three years of construction period inclusive of existing Phase-I, Phase-II network and newly deployed network infrastructure.

b) **Proposed BharatNet Phase-III Zones on Gujarat Map**

For contiguous geography and integration of Phase-I districts, Gujarat will be distributed in 6 x zones (Ahmedabad, Gandhinagar, Surat, Vadodara, Rajkot, Bhavnagar) under single package of Gujarat State for GFGNL operational prospect of view.



Zone	Scope Counts of Phase-III		
	Districts	Gram Panchayats	Revenue Villages
Ahmedabad	4	2089	177
Bhavnagar	5	2254	99
Rajkot	6	2374	395
Gandhinagar	6	2464	1005
Surat	7	2432	1083
Vadodara	6	2616	1382
Grand Total	**34**	**14229**	**4141**

Table-A (BharatNet Phase-III)

Note –

a) Due to geo-political boundaries realignment as per government mandates /resolutions scope may vary, However, bidder is abide to execute the work based on the defined scope in the RFP and assigned workorder.

b) The geographical boundaries for GFGNL operations detail scope details are enclosed in the section 9.21 & 9.32.

c) As such, Strategic government locations of around 480+ numbers connected on BharatNet Phase-II will also be part of this bid scope for which details are shared separately enclosed in annexure-XXXIX.

d) Though the first and foremost objective of this RFP is to fibrized Gram Panchayat(GPs), villages on demand basis and block/sub-block the Point of Presence ,for widespread utilization of the network, are to be given at all Block/Sub-block, GP , Revenue villages on demand. However, Based on GFGNL competent authority approval, PIA selected through this rate contract bid may responsible to expand the scope based on GFGNL request on same rates and all other terms and conditions will be treated sepratly. The bidder shall be paid for the arrived value of the RFP as per clause mentioned in “rights to vary quantities” in the financial bid clause.

e) Please go through the fibrization principles laid in the RFP for meeting the cost efficient and continuity in the network.

f) The above counts of the locations are though prepared with utmost care and for the purpose of price discovery. However, the sub-block / master block shall be finalized during the design stage to ensure effective and optimized traffic network planning.

iii. PIA shall be responsible to do survey, planning, design and build Amended Bharatnet Program (i.e., BharatNet Phase-III) network architecture to provide 1Gbps bandwidth per each Gram Panchayat which shall be scalable to 10Gbps bandwidth per each Gram Panchayat across Gujarat by ensuring to design and implement OFC route based on network design concepts provided in subsequent RFP sections.

iv. The 1st priority would be GP location/GP building. Wherever GP building is not available or having infra issue, then bidder may plan and install at other govt building in that Gram Panchayat territory

or at Discom sub location post taking consent/writing approval from GFGNL. Considering this, Bidder may advice to plan the new GP equipment in ring co-located at GUVNL/Discom sub-station wherever feasible in consultation with the GFGNL/IE and serve the GramPanchayat through feasible technologies. However,As last priority, some rented place may be sought with approval of GFGNL/IE. The GFGNL shall pay the rentals on account of above. However, bidder must ensure placing of OFC loop chamber near gram panchayat building considering future need.

v. BharatNet Phase-I has leased fiber from OLT (BSNL Exchange at Sub-block) to FPOI locations and underground fiber from FPOI to GP wherein BharatNet Phase-II has end to end fiber starting from State Data Centre to GP, where the StateData Centre to OLT/Block/Sub-block and OLT/Block/sub-block to OLT/Block/sub-block are in OFC ring. Further OLT(Shelter location at Sub-block) to GP are in linear with GPON technology. Connecting all Phase-I and Phase-II GPs will require precise fiber network planning considering the ring topology, replacing leased fibers with underground new OFC work with minimum 24F/48F and implementing IP-MPLS routers at Existing OLT(Sub-block/Block) location and implementing IP-MPLS routers at existing ONT (Gram Panchayats) locations. This will also include O&M of existing laid network along with reconstruction of damaged routes as well as getting existing aerial OFC route to underground as per EI(Engineering Instruction).

vi. PIA shall use existing OFC routes of Phase-I and Phase-II BharatNet network except leased routes for linear OFC to ring OFC topology to deliver at each GP of Gujarat.

vii. The project implementation shall follow underground OFC based on existing methodology adopted in that area.

viii. The PIA shall intimate GFGNL/IE regarding the placement of sub-block inventories (active and passive). Based on the proposal submitted and subject to approval from the Independent Engineer (IE) and GFGNL, considering better governance and design requirements, GFGNL may permit placement of inventories (active and passive) either within existing BSNL exchange premises or through the construction of new shelters for the BharatNet Phase-III network, in accordance with the requirements specified in this RFP without any deviation in the solution. Selected bidder has to co-ordinate including the separate agency of shelter during Handover takeover process and with various stakeholders during the entire contract duration. The Selected Bidder shall be responsible for conducting joint site visits in coordination with GFGNL and relevant local agencies to minimize the likelihood of future change requests. GFGNL shall provide administrative facilitation, wherever feasible, to support the process.

ix. State/SIA will support space and raw power supply requirements for the equipment to be installed at GP as well as telecom grade existing shelters in Bharatnet Phase-II and in phase-I BSNL exchanges for ABP. However, It is the responsibility of GFGNL/local authorities to provide space and power source including their recurring bills. The extension of power cable from nearby raw power supply, applicable power cabling and electrical and other safety of equipment will be in the scope of PIA.

x. GFGNL's long term vision is to gather the government common asset for betterment of state and governance. In this regard, selected PIA has to support with their resources to utilize them in Amended BharatNet program (BharatNet Phase-III) during the entire contract duration without

any further cost to GFGNL.

xi. Selected bidder has to Fulfil additional requirements, if any, in the larger interest of the Government Network under BharatNet, such as dark fiber delivery, additional OFC work, any other service provisioning for GFGNL/DST/DoT/DBN empanneled partners and other measures to enable optimal utilization of the network.

xii. Further,As part of the **upgradation,** the following activities shall be performed:

a. Upgrade existing BharatNet network to make it robust, redundant and carrier-grade.
- The PIA shall replace the existing GPON equipment with IP-MPLS routers (Access/ Aggregator)
- The existing OFC network shall be upgraded from linear to ring topology.
- Maitain the existing OFC network and (active and passive) electronics of SDC to Block.

b. PIA shall integrate the existing (Phase I & II) GPs and newly discovered/ un-connected GPs (to be created) under BharatNet network. PIA shall conduct a detailed survey report to cover all the GPs by forming GP rings. These rings may consist of existing (Phase I & II) GPs and newly covered GPs (to be created) under BharatNet.

c. PIA shall integrate existing BharatNet infrastructure with NOC as required to be implemented under the project. PIA shall integrate entire BharatNet infrastructure existing (Phase I & II) and newly created network with the EMS and NMS to be deployed in State NOC/SDC. Further the NMS of State NOC shall be integrated with the NMS of centralized BharatNet NOC(Bangalore/Delhi/any other locations decided by DoT/DBN/GFGNL). Note: Successful Bidder shall take the handover of the existing system as is where is basis as per NOC delivery timeline, it is bidder's responsibility to migrate the existing system through respective EMS to new single platform for better monitoring of existing and new network assets. It is hereby clarified that the existing GFGNL BharatNet Phase-II support arrangements for GIS and NMS are presently valid up to 30 June 2027 and 30 May 2028, respectively. However, the actual tenure may vary based on the provisions of the existing contracts and the decisions of GFGNL.

d. GFGNL reserves the right to onboard Agency for IE/QA/Factory QA. GFGNL will separately communicate the details of the IE/QA/Fatcory QA/etc. agencies to the selected bidder through an SoP or any other appropriate mechanism, including their defined roles and responsibilities for the project. However, the selected bidder shall be required to provide full support across all deliverables.It is the bidder's responsibility to share daily progress report and intimate to GFGNL/ its appointed agency / IE in advance atleast before 7 calendar days in order to manage travel and inspection/testing on time.

e. The detailed roles and responsibilities of IEs are specified in the relevant sections of the RFP. However, the Bidder shall ensure timely and adequate support to GFGNL and its authorized agencies for all field-level and back-office activities, as and when required.

f. Further, GFGNL through IE will have the all rights to optimize network solution. The GFGNL Authority intends to achieve timely implementation of BharatNet Phase-III with optimal lifecycle cost while ensuring full compliance with the Scope of Work, Technical Specifications, network performance parameters, safety standards, and statutory obligations. Accordingly,

this Contract provides for structured cost optimisation and value engineering during execution, without altering the intended functional outcomes of the Project.

g. PIA shall integrate the existing (Phase I & II) GPs and newly covered GPs (to be created) under BharatNet middle mile network. PIA shall conduct a detailed survey to cover all the GPs in a circle by forming GP rings and child rings. These rings may consist of existing (Phase I & II) GPs and newly covered GPs (to be created) under BharatNet middle mile network.

h. ~~PIA shall integrate existing BharatNet infrastructure with NOC as required to be implemented under the project. PIA shall integrate entire BharatNet infrastructure existing (Phase I & II) and newly created with the EMS and NMS to be deployed in State NOC (to be created as part of this project). Further the NMS of State NOC shall be integrated with the NMS of centralized BharatNet NOC.~~

i. The bidder shall safely retain and store the existing equipment for a minimum period of six (6) months from the date of migration on new technology or from the intimation from GFGNL whichever is later. However, in both the cases safety and security of the all network elements will be with PIA. All costs associated with transportation, loading/unloading, warehousing, and handling of the equipment during this period shall be borne by the bidder.The equipment/s shall remain the property of the GFGNL. Responsibility for material security, including protection against theft, loss, and unauthorized access during the storage period, shall rest with the bidder until the equipment is formally handed over to the designated location defined/instructed by the GFGNL.The final handover location shall be communicated to the PIA once finalized. No separate claim for transportation, warehousing, handling, or storage charges shall be given on this account.

5.3MAKING OVER THE NETWORK TO PIA BY GFGNL

5.3.1 HANDOVER/ TAKEOVER OF THE EXISTING BHARATNET PHASE-I & PHASE-II NETWORKS:

a. As per the geographical and technical boundaries mentioned above for BSNL and GFGNL, existing agencies shall hand over the Phase-I and Phase-II Network to the PIA selected through this bid, through its existing O&M agencies.

b. At field level, the newly onboarded PIA shall co-ordinate with the existing O&M agencies of phase-I and Phase-II, and the other stakeholders mentioned in respected below section for physical handover/ takeover of the BharatNet Phase-I & II network.

c. The handover/ takeover shall be completed within a maximum time period as per below table (Table X.1.1) from the agreement signed date, in “good condition” (optical power is in the range -8 dBm to -25 dBm).

b. The handover of the BharatNet Phase-I and phase-II network shall be Block wise, for those blocks, where at least 50% GPs in Phase-I and 100% GPs in Phase-II are having optical power as specified above.

c. The PIA shall be responsible for overall O&M of the OFC network including GPON equipment,

logistics, replacement of faulty GPON, SPV equipment, spares management and also after the MPLS routers are commissioned in the Block and GP. Further, Selected PIA shall be responsible to improve the OFC network/remaining core of phase-I and phase-II on achieving -25dB or better optical power from day-1 of the contract signed.

d. Timeline for the Blockwise Handover/ Takeover of the existing BharatNet Phase-I and Phase-II networks are mentioned below.

S. No.	Milestones	Timeline
1	Existing network handover completion of 20% of the network**	T*+1 month
2	Existing network handover completion of 40% of the network**	T + 2 months
3	Existing network handover completion of 60% of the network**	T + 3 months
4	Existing network handover completion of 80% of the network**	T + 4 months
5	Existing network handover completion of 100% of the network**	T + 5 months

*T is appointed date i.e. date of signing of agreement between selected PIA and GFGNL.

**Network includes passive infrastructure and active infrastructure.

Table X.1.1: Timelines to handover existing network of phase-I and Phase-II

Note:

I. The Milestone wise % GPs to be taken over by the PIA as mentioned in Table X.1.1 above are not restrictive. If more number than specified number of GPs against any milestone are having -25dB or better optical power and the PIA is willing to take over some or all such GPs and/or associated OFC network, the PIA shall be allowed to take over the same (complete block) from the existing O&M agencies in Phase-I and O&M agencies of State government SIA in phase-II. Even if the PIA is willing to take over OFC network of the GPs whose optical power is below -25dB, it will be allowed to take over the same.

II. However, after Five(5) months from appointed date, the entire network shall be deemed to be made over to the PIA on as is where is basis.

III. In those blocks, where complete OFC network of the block is taken over by PIA and all the GPs are not up, on date of such taking over, the PIA has to make additional 5% GPs of the block as operational every month after 2 months from such taking over date, till all the GPs are made operational. A penalty of Rs. 5,000/- per month per GP shall be levied and deducted from the O&M invoice, for such shortfall of achieving 5% addition in operational GP count of the block, every month from 4th month of taking over date. The GPs becoming operational as per NoC report, will be counted for AMC payments from date of becoming operational. The "Date of Becoming Operational" shall mean the date on which the applicable scope is successfully commissioned, accepted, and declared operational by GFGNL/IE as per the acceptance procedure specified in the RFP. The same shall be considered as 100% go-live.

IV. O&M Payment for Non-functional routes after handover: Payment shall be made only for the routes which are made operational by PIA.

V. For additional details , also refer the details mentioned in the following section

"*INFRASTRUCTURE HANDOVER TAKEOVER*" of O&M section.

5.3.2 **Existing Infrastructure:**

Site of the Existing Network shall include an inventory of existing network infrastructure across Blocks, Gram Panchayats (GPs) and Villages along with laid OFC infrastructure. The indicative information is described in section ANNEXURE-XXXVIII – List of Existing Network Inventory for BharatNet Phase-I and Phase-II and in other relevant sections.

Aside to above, For Phase-I EMS please find details below, Phase-II details already enclosed in the annexure above,

Network Component	EMS NAME
OLT/ONT	TEJASEMS-S4
	ITIEMS1
	TEJASEMS-S3
	TEJASEMS-S1
	TEJASEMS-S2
	ITIEMS2

5.3.3 **GP End Equipment:**

(a) The Network shall be made over Block wise with the GPs whose optical power is -25 dB or better at the GP end equipment. The same shall be ensured by the outgoing O&M agencies for Phase-I and O&M agency of GFGNL for Phase-II. The details of the equipment installed at GP End i.e. ONT, CCU, Battery (with replacement Date), Solar Panel, Enclosure, Earthing, and Splitter etc. will also be provided.

(b) For temporary purpose till the existing agencies of GIS/NMS contract end, The PIA shall be given access to NMS, GIS, or any other tools wherever feasible, so as to see the status of the existing network and seek clarification, mention any observation in the handover – takeover (HOTO) process.

(c) The Project Implementation Agency (PIA) shall be responsible for the operation and maintenance of all equipment, including existing inventory, even after the installation of new routers or replacement equipment at the Gram Panchayat (GP). The security and safeguarding of all existing as well as newly installed assets shall remain within the scope of the selected PIA until further instructions are issued by GFGNL on behalf of DBN.The GP-level equipment may continue to be utilized for providing or sustaining FTTH connections at the GP or associated institutions such as schools, subject to approval from GFGNL/Independent Engineer (IE). In cases where such services are provisioned through BharatNet Udyami, or where end customers are connected through procurement processes carried out by GFGNL or it's agency, the PIA shall transfer the relevant equipment or services through a formal Handover-Takeover (HOTO) process under similar terms and conditions with an approval from the GFGNL without any additional cost to GFGNL.

5.3.4 **Block End Equipment:**

a) The OLT along with make model, configuration, cards and PON diagram shall be made over by BSNL/FMA for phase-1 and O&M agency of SIA for Phase-II to the seletect PIA. The PIA shall be responsible for overall O&M till the network until it is integrated with the MPLS router, and shall continue to manage O&M after migration to MPLS for the entire contract duration.

b) After transfer of network to the new equipment, the PIA shall keep the inventories with their storage location, located in state of Gujarat in consultation with the GFGNL by mutual signing off on inventory details including IE. PIA will be responsible for the inventory security and safety on be half of GFGNL until further instructions are issued by GFGNL on behalf of DBN.

5.3.5 **OFC Network**

(a) The OFC network corresponding to the GPs whose optical power is OK (-25 dB or better) and made over to the PIA by the outgoing BSNL agencies for Phase-I and O&M agency of GFGNL shall be transferred to the PIA for O&M on as is where is basis. The complete L-14 diagram, HLD, LLD mentioning the routes shall be signed by the BSNL agencies, PIA, BSNL for Phase-I and O&M agencies of GFGNL, PIA, for phase-II. Details of temporary restoration etc. shall also be marked. The PIA, if required, can mention its observations in the HOTO process.

(g) The responsibility of attending the faults in the damaged OFC routes is with the outgoing agencies for Phase-I and O&M agencies of GFGNL for Phase-II. The agencies for Phase-I and O&M agencies of State Government SIA for Phase-II , shall progressively make over such GPs whose optical power is made available (-25dB) to the PIA with details of the routes marked on the L-14 (already available with the PIA) in between the handover takeover process. The equipment of such GPs shall be made over by the outgoing agencies in phase-I and outgoing O&M agency (PIA) of state GFGNL in Phase-II.

(h) However, in cases, where, from the Date of first GP make over to the PIA, the outgoing agencies for Phase-I and O&M agencies of State Government SIA for Phase-II fails to make over some GPs within 3 months or hoto process whichever is lower, the PIA shall be bound to take over such GPs also.

(i) PIA shall be responsible for Overall O&M of the network elements both at Block and GP level.

Note: In cases where underground laying of 48F OFC is not feasible, overhead deployment using two (02) numbers of 24F ADSS OFC cables may be adopted as an alternative solution. However, such an arrangement shall be considered equivalent to a single 48F route, and the Route Kilometre (RKM) shall not be treated as double on account of laying two 24F ADSS OFC cables. Accordingly, measurement and payment shall be based on the actual route length only, and no additional RKM shall be considered for the second 24F ADSS OFC cable.

5.4 SITE SURVEY AND PLANNING

~~The PIA shall conduct an exhaustive video-based site and route survey based on an optimal/~~

~~shortest path to connect Gram Panchayat (GP) and Block/sub-block as defined under the scope of work for construction and upgradation of network.~~ The PIA shall conduct an exhaustive video-based site and route survey based on an optimal/ shortest path to connect Gram Panchayat (GP) and Block as defined under the scope of work for construction and upgradation of network. All the videos during Survey shall be taken using Mobile APP provided by the PIA and PIA shall take the videos as per the specifications in 5.16 ,i.e., "Videography" , which shall be uploaded in the BharatNet GIS platform in the SNOC/CNOC. All related credentials shall be provided by the PIA to IE and GFGNL with all applicable rights without any additional cost to GFGNL. PIA shall perform the following activities for site survey and planning:

a) GFGNL shall provide the GIS details for site and route data of the Existing Network to the PIA wherever possible.

b) The PIA shall deploy a GIS based planning tool for desktop planning. The tool based on the Geo coordinates of the Block and the GPs shall provide the initial optimal path of the connectivity using road data. The PIA shall use such initial plan for physical site survey.

c) PIA shall conduct an actual Geographic Information System (GIS)-based survey for the area under scope of work.

d) The PIA shall record with videos, constraints about the changes in the desktop routes proposed based on physical survey. I.E. and GFGNL may use such evidence/s for approval of the design and BoQ. The access of such GIS based planning tool shall be given to the IE and GFGNL also without any additional cost.

e) The PIA shall ensure that the GIS based file formats should be compatible with BharatNet GIS platform. Furthermore, sharing and integration of GIS data under this project with the afore-mentioned platform shall be the responsibility of the PIA and GFGNL shall provide reasonable assistance in the same wherever feasible.

f) During the survey, the PIA shall consider connectivity till Gram Panchayat (GP) based on the optimal path for fibre layout covering maximum population en-route.

g) The PIA shall provide all the relevant drawings such as network diagram, L-14, As Build Diagram (ABD) of OFC(UG and Aerial), ISP and OSP work including shelter infrastructure, related for the Development Works and/or the Upgradation Works for New Network and Existing Network to GFGNL and its designated agency. The network diagram shall include both High- and Low-Level Design (HLD & LLD).

h) The PIA shall create/update the relevant engineering drawings/design in case of future upgradation, ensure updation of GIS platform and other relevant systems as required by GFGNL/IE.

i) All engineering drawings/design and documents shall be created, updated and maintained by the PIA on its system/tool or portal and shall be accessible to GFGNL throughout the Contract Period. All these will eventually be handed over to GFGNL and will ~~become~~ solely property of DBN, DoT.

j) The GPs of BharatNet Phase-I and BharatNet Phase-II, that are merged with municipalities or urban areas and are currently active, shall continue to be utilized by GFGNL and no further ring creation for these GPs are not required.

5.5 CONSTRUCTION AND UPGRADATION OF THE NETWORK

5.5.1 RING ARCHITECTURE USING IP-MPLS

a) Project Implementation Agency (PIA) shall be responsible for survey, planning, design, supply, installation, end-to-end integration, and commissioning of newly deployed and upgradation of existing network infrastructure including Optical Fibre Cable (OFC) network (underground and aerial). Primarily, the PIA shall plan OFC construction through Underground laying. However, wherever, the same is not possible, the next alternative shall be ADSS OFC laying preferably using existing electricity infrastructure.

b) The same shall be approved by GFGNL based on recommendation of IE with appropriate justification and constraints for underground laying. In case it is not feasible to lay the OFC (either underground or ADSS), the PIA shall represent the same to the IE. The IE after verifying with the field conditions shall submit the same to GFGNL. GFGNL will take a final decision for deployment of alternate technology to connect such GPs based on the recommendation of IE and/or its field unit report. However, post n/w integration, the O&M of such GPs shall also be the responsibility of the PIA including its integration with State- Network Operation Centre (S-NOC). The PIA shall be responsible for connectivity across all Gram Panchayat (GP) in accordance with Schedule of Requirement and ensure upgradation of the existing network infrastructure into ring topology with IP-MPLS network.

c) The GPs already connected on Satellite media under BharatNet Phase-I project shall also be planned for connectivity on OFC network or any other alternate technolgoes on IP-MPLS.

d) Based on the network infrastructure to be deployed under this project, all permissions shall be obtained by the PIA, as required under Applicable Laws, relevant Applicable Permits, license(s), authorisation(s) and permissions from Department of Telecom / Government of India/ State Governments.

5.6 FIBERIZATION AND DESIGN PRINCIPLES

5.6.1 PIA shall follow the fiberization Principles for Phase-I network as stated below.

S. No.	Network Layer	Fiber Path Name	Fiber Work Type	New Fiber Type (Minimum Requirement)	Fiber topology (Termination/Spare)	Fiber path Protection on separate route
1	**High Speed Data Corridor**	Master Blocks	ILL/P2P to be arranged by the GFGNL through Service Provider/s	NA	Master Block Site Selection: Existing more than 2(ring) OFC path will be first priority, However, based on traffic and network topology existing ring(2) OFC path may be consider.	NA
2	**Block / Sub-Block corridor**	Master-block to Sub-block/**Sub-block to Sub-block**	Existing/ New Work with shortest route	48F (Armoured – Ribbon)	All cores of fiber to be terminated in FDMS at Sub-block in each path. 36F to be remained spare end to end between block to block after utilizing in network topology	Minimum Two Path
3	**Access corridor** (Sub-block to GP)	**Sub-block to FPOI (**Existing Leased route)	New work – Straight route	24F (Armoured - LT)	12F to be remain spare end to end after utilizing in network topology	Minimum Two Path
4	**Access corridor** (Sub-block to GP)/	Ring work for Gram Panchayat (Subblock/**FPOI to GP)**	New work + Repair work	24F (Armoured - LT)	12F cores to be terminated in FDMS at GP in each path. Remaining fibre cores shall be pass through (continues through the enclosure/splicing tray without being terminated). 12F to be remain spare end to end (Sub-block to GP and GP to GP ring) after utilizing in network topology	Minimum Two Path

5.6.2 PIA shall follow the fiberization Principles for Phase-II network as stated below.

S. No.	Network Layer	Fiber Path Name	Fiber Work Type	New Fiber Type (Minimum Requirement)	Fiber topology (Termination/Spare)	Fiber path Protection on separate route
1	**High Speed Data Corridor**	Master Blocks	ILL/P2P to be arranged by the GFGNL through Service Provider/s	NA	Master Block Site Selection: Existing more than 2(ring) OFC path will be first priority, However, based on traffic and network topology existing ring(2) OFC path may be consider.	NA
2	Block corridor	Master-block to Sub-block/**Sub-block to Sub-block**	Existing OFC Route+ Repair work	48F (Armoured – Ribbon)	All cores of fiber to be terminated in FDMS at Sub-block in each path 36F to be remain spare end to end between block to block after utilizing in network topology	Minimum Two Path
3	Access corridor (Sub-block to GP)	Ring work for Gram Panchayat **(Sub-block to GP)**	New work – Straight route+ Repair Work	48F (Armoured - Ribbon)	12F cores to be terminated in FDMS at GP in each path. Remaining fibre cores shall be pass through. (Continues through the enclosure/splicing tray	Minimum Two Path

S. No.	Network Layer	Fiber Path Name	Fiber Work Type	New Fiber Type (Minimum Requirement)	Fiber topology (Termination/Spare)	Fiber path Protection on separate route
					without being terminated). Rest of available fiber (min 36F or above) to be remain spare end to end (Sub-block to GP and GP to GP ring) after utilizing in network topology	

* All new work /re-work should be through armoured cable only.

1. PIA has to ensure GP to GP ring on minimum 24F LT Armored in case of Phase-I and minimum 48F Ribbon Armored in case of Phase-II on shortest possible path to be terminated on Sub-block to Sub-block ring for better uptime. PIA may use existing healty fiber cores in network design subject to fiberization principles, mentioned above, are fulfilled.
2. Prefrebly Preference for new fiber work should be ROW be roads like shortest possible path on National highway, State highway and District major roads.
3. New OFC routes and last miles are to be built in such a way that it should be enroute to connect Revenue Villages, Government Schools, Police stations/chowki, Health centers, banks, post offices, forest offices, fair price shops, animal husbandry, Food and civil supplies, co-operative and government field offices, tourism destinations, community science centers, R&B toll booths, fisheries, Port and SEZ, GIDC, Telecom towers.
4. Fiber loss guideline for each section should be following,
5. For 1310nm: 0.34 dB attenuation per Km (1310 nm) + 0.1 dB / splice + 1 dB connector loss
6. For 1550nm: 0.22 dB attenuation per Km (1550 nm) + 0.1 dB / splice + 1 dB connector loss
7. PIA has to ensure for no any deviation found in engineering guideline (i.e. No depth deviation other than declared, protection to less depth as per RFP, zero deviation or fault in installation & supply during inspection).
8. PIA has to keep suitable OFC loop length at standard distance for better operations and future requirements.
9. PIA has to ensure dual home /Ring Criteria as per below:

a) The number of GPs in a GP ring shall normally be around Six (6) to Seven (7) connected sequentiallly over maximum 02 cores of fibers in such a way that dual fiber cut in GP ring/ GP infrastructure outage shall impact to those ring GPs only, hence long distance GP ring shall be avoided. In case, more than 7 (seven) GPs are necessitated to be connected in a ring as per survey, the same shall be implemented after justification and recommendation by the I.E. and approval by GFGNL.

b) The number of GPs in a child GP ring shall be maximum five (5). The PIA can also plan child rings (as per HLD diagram shown in the tender) in case the creation of GP ring from sub-block is not feasible due to distance from block or any other reason. The PIA shall conduct a detailed survey and prepare the report in consultation with IE for each case and submit it to GFGNL for approval of such Child Rings. However, the overall scope for GP counts in one ring if includes child GP/s, number of total nodes in the GP ring should not be more than 10.

c) Each GP ring preferabally integrate in dual homed on adjacent block routers with optimized OFC route. Where, dual homed means, GP router to be parented to two-different sub-blocks for mitigating any single point of failure risk associated with router/location. Child GP ring with preferably parenting on two different feasible GP routers connected to two different Sub-Block / Master Block Rings with out any deviating Clasue 5.6 FIBERIZATION AND DESIGN PRINCIPLES. Further, Any Child GP Ring parented to one feasible GP Router will also be consider based on O&M and geographyical / field constraints.

d) Depending on the non-feasibility of the ring architecture deployment, PIA may recommend to GFGNL/IE to deploy suitable network architecture (linear) other than ring architecture in a GP/ GPs. If ring architecture is not techno-commercially feasible, GFGNL shall approve the same based on the recommendation of the PIA and/ IE or based on GFGNL field officer's recommendations on case-to-case basis.

e) The physical fibre routes connecting GPs and Sub-blocks shall be designed to ensure ring topology resilience.

– The primary and secondary routes should preferably be laid on entirely different roads to eliminate the risk of common point failures.

– Where routing on different roads is not feasible, the primary and secondary cables may be laid on opposite sides of the same road as an acceptable alternative by submission of proper justification.

f) Similarly, sub-block needs to connect in preferably dual home connectivity and to be parented on adjacent master block.

g) One path for GP ring should be on existing fiber path and another path for GP ring should be preferably on physically separated-fibre path.

h) In cases where a Gram Panchayat (GP) has only a single connectivity and the distance from the existing physically separated access/distribution fibre route- tapping point- is less than 1000 meters away, For those GP construction of a 2nd path for ring shall not be required. For such GPs, ring connectivity shall be established through a folded path configuration in consultation with IE/GFGNL. ,i.e., a folded path means IN & OUT on the same route-Physically linear and logically in ring connectivity.In case, the distance is more than 1000 mtr, then alternative technology like FSO or on Aerial linear OFC with RCC Pole may be applied for ring. This limit of use of alternative technology or aerial linear is over and above the permissible limit

providing suitable justification for single road or geographical challenge to GFGNL and it will not counted for the purpose of calculation to control the upper cap.

10. PIA has to do fiber work for "**Repair-Reconstruct- Rectify-Replace"** of existing fiber of Phase-I and Phase-II, as a part of regular O&M activities.

a) GPs already connected through 96F/48F ribbon type and 24F loose tube type fibre for underground OFC to be upgraded with the OF cable of **same count** of fibres across all Gram Panchayats (GPs).

b) The PIA shall also plan and lay 24F (in replacement of BSNL/Railtel leased fiber from block to FPOI) as per the requirement based on survey. Multiple FPOI in same route (from block to FPOI on existing BSNL fiber), may require 2x24 Fiber OFC, PIA shall lay 48F OFC in such a route/s.

11. For Kutch region: The Kutch region of Gujarat is vast geography with low density of population. Further, most of the area is long distances desert, coastal and border area. In the larger interest of cost optimization without diluting the services to the citizens, the following special provisions in the design are allowed:

    I. Provisioning of a single UG path, in place of a redundant arrangement, shall be permitted for a maximum of 10% of the total GP scope in the Kutch region, subject to no compromise on link capacity and SLA performance parameters.

    II. Permissible limit for use of alternative technology for GP ring closure without diluting link capacity and SLA performance parameters = Up to 20% of GPs scope of Kutch regions.

12. For rest region of Gujarat (Other than Kutch): Some of the area (minor in geaography) are having terrestrial challenges like mountains, small rivers, hard rock, dense forest and to name like part of some region of Banaskatha, Sabarkantha, Arravalli, Mahisagar, Dohad/Dahod, ~~Chhota Udaipur~~, Narmada, Tapi, The dang, Valsad district and etc. In the larger interest of cost optimization without diluting the services to the citizens, the following special provisions in the design are allowed:

    i) Single UG path connectivity, in place of a redundant path, shall be permitted for a maximum of 4% of the total GPs excluding Kutch region, subject to no dilution of link capacity and SLA performance parameters.

    ~~ii) Use of alternative technology for GP ring closure shall be permitted for a maximum of 8% of total GPs excluding Kutch, subject to compliance with approved link capacity and SLA performance parameters.~~

13. Special provision for ADSS cable (Overhead) deployment

    I. In general, for Block-to-Block (Sub-Block to Sub-Block) routes, the ADSS cable is strictly not permitted, however in exceptional terrestrial circumstances, the PIA must have to obtain the approval of IE/GFGNL.

Note : The PIA cannot start availing above special provisions within the prescribed ceiling until and unless intimation with proper justification to GFGNL and upon receiving approval of GFGNL.

Underground OFC deployment shall remain the preferred mode. Where underground deployment is not technically feasible due to site conditions such as utility congestion, hard strata, waterlogged

areas, ROW constraints, safety considerations, or other field constraints, the PIA shall submit a justified proposal with supporting survey details and recommendations for approval by GFGNL/IE. The approval process shall be governed by the relevant provisions of the RFP, and the PIA shall proceed only after obtaining the necessary approvals. Payment shall be made based on the actual quantities executed and approved under the applicable SOR /Financial line items and accepted by GFGNL/IE.

13. ~~Following the completion of Trenching and Ducting (T&D), the Duct Integrity Test (DIT) should be performed prior to cable blowing to ensure system readiness and avoid future challenges.~~
14. The project implementation shall follow underground (UG) optical fibre cable (OFC). Primarily, the PIA will plan for OFC construction through underground laying. However, where underground laying is not feasible, the preferred alternative will be the laying of ADSS (All-dielectric Self-Supporting) OFC, preferably utilizing existing electricity infrastructure, subject to approval by the local distribution company (DISCOM) in rural area. If existing infrastructure cannot be utilized, new pole infrastructure will be installed to support ADSS OFC laying. Wherever the existing electricity poles are not available; the PIA shall erect a 7 Meter RCC pole. The PIA shall have to replace such poles damaged for any reason whatsoever during the contract period without any additional cost to GFGNL.
15. It is the PIA's responsibility to maintain & manage overhead Cable without diluting uptime/ SLA. The Pole must be stable enough to withstand against external environment. The wooden/G.I. Poles is not allowed. The pole should be proper and of RCC. The alternative technology in free space optic connectivity is also an option given to PIA for cost effective medium.
16. All UG OFC shall be armored, and UG OFC and ADSS OFC meet the technical specification. Underground OFC laying work, including new OFC laying under Phase-III and repairs, reconstruction, rectification, replacement of existing fiber under Phases I and II, shall be done using armored OFC only.
17. PIA has **Preference of methods for fiberization** should be followed.

a) New fiber work shall be terminated at existing / new healthy fiber tapping point considering fiber loss margin is maintained.

b) Indicated fiber type is a minimum requirement to have uniform architecture across Gujarat; Bidder shall use minimum or higher fiber cores/fiber Type (i.e. 48F/96F or Multiple 48F/96F) for OFC deployment to ensure spare (free) fibers reservation as per 5.7.1 & 5.7.2 and for commercialization activity.

c) The ideology for the protection path is to achieve high network availability and hence to be design preferably in separate physical path. For the exceptional cases having ground challenges, same physical path (preferably on other roadside) may be used in protection after taking concern from GFGNL/IE.

d) The Selected PIA has to submit the quartly OFC utilization report of each core of the network.

e) Fiber cores used in existing customer delivery (Dark Fiber/FTTH partner/RSP/Other customer) will be counted with customer name/ID.Selected PIA will be solely responsible to understand the existing dark fibre customers OFC network connectivity and manage the OFC route as per

the defined SLA/KPI in this RFP for entire contract duration.

f) New fiber path preference sequence is to have major network assets on demanding / high traffic routes with an aim to improve asset utilization. Bidder may choose optimum solution considering route length and given preference.

g) In case where existing routes of GP-GP ring is common in subblock-to-subblock corridor, then number of spare fibers should also be common. (i.e. 36F Spare fiber on common route). In other words, the duplication of spare fibers on common route should be avoided.

i. **Strategic/Other Location Connectivity** – AMC, O&M and Change Management (Ref. Annexure-XXXIX)

a) As indicated earlier, under BharatNet Phase-II/I, has extended network connectivity to certain strategic locations, including but not limited to GIDC Buildings, Statue of Unity – SoU, Government of Gujarat Buildings, Prant Offices, RSMs, Public Places, TC/DC/BHQ/TDO/DDO etc. These strategic locations are connected either through the GPON network or via Layer-2 switches or transport switch extended from the respective parent Gram Panchayat (GP) or Block node.

b) The selected bidder shall be responsible for providing comprehensive Annual Maintenance Contract (AMC) and Operations & Maintenance (O&M) services for all such strategic locations, covering both active and passive infrastructure, including but not limited to fiber, OLT/ONT, switches, power systems, accessories, and associated network elements. The detailed inventory and site-wise scope are provided in Annexure-XXXIX in clause 9.39, which shall form an integral part of this RFP.

c) Further, the selected bidder shall bear sole responsibility for all activities related to traffic and service migration, network re-configuration, IP address scheme modification, service provisioning, integration, and future change management for these strategic locations, without any additional dependency/burden on GFGNL.

d) The AMC and O&M charges for these strategic locations shall be paid other than GP O&M payments and shall be considered as part of the overall O&M billing. Payment shall be made at a rate of Rs. 13,500 per site per quarter, subject to successful submission and acceptance of valid documentation, reports, and compliance certificates as prescribed by GFGNL.

e) The Service Level Agreement (SLA), performance metrics, and penalty provisions applicable to these strategic locations shall remain the same as defined for Gram Panchayat (GP) sites under this RFP, unless explicitly stated otherwise.

5.7 SITE SURVEY AND PLANNING

The PIA shall conduct the initial survey as per survey milestones, mentioned in the table below:

Survey Milestone No.	Period for completion of initial survey	No. of GPs to be completed (percentage of total GPs)
I	T0 + 3 months	5%
II	T0 + 6 months	15%
III	T0 + 9 months	40%
IV	T0 + 12 months	95%
• T0: Appointed Date		

a) Any delay in above-mentioned timelines for initial survey shall attract a penalty of Rs. 100/- per shortfall GP per week or part thereof.

b) There shall not be any relaxation in the timelines for Project Milestones, as mentioned above, on account of the survey timelines mentioned herein.

c) The PIA shall submit the Block wise **site survey reports** in line with the guidelines mentioned in this RFP. The Project Implementation Agency (PIA) shall prepare and submit ~~Block-wise~~ **site survey reports** to the Independent Engineer (IE) for certification, ensuring compliance with the guidelines specified in this RFP. Upon certification by the IE, the report shall be forwarded to the GFGNL for approval. Format of Survey report is attached below as "**Format of Survey Report"** for reference. The approved reports will form the basis for subsequent implementation activities. The prescribed format for the Site Survey Report is provided below for reference, However, GFGNL reserves the rights to modify the format and share the updated format to selected bidder.

Format of Survey Report:

	Format of Survey																			
S.No.	Sub-Block Name	Sub-Block LGD Code	Total No of GP	Main Ring		Child Ring		Existing OFC (FPOI to GP) to be used in Ring (in Km) – Phase-I	Existing OFC (Block - shelter to SDC/Block shelter) to be used in Ring (in Km) – Phase-II	Existing OFC (Block Shelter to GP) to be used in Ring (in Km) – Phase-II	Interconnect OFC for Phase-I OFC with Phase-II OFC to be laid in Ring (in Km)	Block to FPOI OFC length (to be replaced) in Km – Phase-I	OFC to be laid for Ring Formation (in Km)		Total OFC to be laid (in Km)		Count of SFP Required			Remarks
				Main Ring	Count	Child Ring	Count						24 F	48 F	24 F	48 F	10 Km	40 Km	80 Km	
1	2	3	4	5		6		7	8	9	10	11	12		13=10+11+12		14			15

Table-A

Infra Structure in GP									
S.No.	Sub-Block Name with LGD Code	Name of GP	GP LGD Code	~~Availability of Shelter at Block Yes/No~~	Availability of space at GP For New Rack Yes/ No	Commercial Electric Supply Availability Yes/No	Availability of Power Supply in Hrs.	~~OLT Available/Not available~~	Remarks

Table-B

d) Based on the approved site survey report and network design by IE/GFGNL, the PIA shall be required to initiate OFC implementation and comply with specifications, design principles and technical/non-technical standards, as per RFP Section given in this tender.

e) PIA shall also be responsible for supply, delivery, storage, warehousing, and handling of optical fibre cable along with fittings and requisite items such as HDPE PLB duct, FDMS, joint enclosures, route markers (should be painted), etc.

f) PIA shall perform all activities required for end-to-end implementation of underground and aerial OFC, within the stipulated time.

g) For the routes, where ADSS is approved as implementation design, the PIA may leverage existing power distribution poles for stringing, jointing, live line installation and commissioning of optical fibre cable from the nearest Block to Gram Panchayat (GP) using appropriate pole clamping and accessories.

h) PIA shall perform end-to-end testing of the OFC laid till Gram Panchayat (GP) in accordance with good industry practice, specifications and standards, and acceptance testing template for quality assurance.

i) The Right of Way (RoW) for the project shall be granted as per the existing agreement with the State Government and facilitated by GFGNL through introduction letters for creation and upgradation of new and existing network respectively during the construction period.

j) During the Operation & Maintenance, the PIA shall also be facilitated RoW by GFGNL, only for replacement and repair of existing fiber deployed to maintain the new and existing network.

5.8 NETWORK DESIGN

a) The Project Implementation Agency (PIA) shall be responsible for the survey, planning, design, supply, installation, end-to-end integration, and commissioning of newly deployed and upgradation of existing network infrastructure including Optical Fibre Cable (OFC) network. The PIA shall be responsible for connectivity across all Gram Panchayats (GP) of BharatNet Phase-I and Phase-II and ensure upgradation of the existing network infrastructure into ring topology with IP-MPLS network. This also includes the scope for newly developed GP time to time during contract duration based on discovered rate through this bidding process.

b) Primarily, the PIA shall plan OFC construction through underground laying. However, wherever, the same is not possible, the next alternative shall be ADSS OFC laying preferably using existing electricity infrastructure (with prior approval from authority) and under the limited scope boundary mentioned in this bid document. The same shall be approved by GFGNL based on recommendation of IE with appropriate justification and constraints for underground OFC laying. In case it is not feasible to lay the OFC (either underground or ADSS), the PIA shall represent the same to the IE. The IE after verifying with the field conditions shall submit the same to GFGNL. GFGNL will take a final decision for deployment of alternate technology to connect such

GPs based on the recommendation of IE and/or its valid field unit report. However, post network integration, such GPs shall also be the responsibility of the PIA including its integration with State- Network Operation Centre (S-NOC). Upon completion of network integration, the PIA shall be solely responsible for the designated Gram Panchayats (GPs) and shall ensure their complete operational integration with the State Network Operations Centre (S-NOC) Gandhinagar as well as in CNOC-Bangalore/Delhi.

c) The PIA shall deploy new network infrastructure in this RFP fall under the BharatNet network scope~~,~~ for providing connectivity upto Gram Panchayat (GP)

d) Based on the network infrastructure to be deployed under this project, all permissions shall be obtained by the PIA, as required under Applicable Laws, relevant Applicable Permits, license(s), authorization(s) and permissions from Department of Telecom / Government of India/ State Governments.

e) **The PIA shall build architecture in two major distinct categories for connectivity across all Gram-Panchayats of BharatNet Phase-I and Phase-II in ring architecture.**

Category-1: Access Layer (Gram Panchayat to Sub-Block)

i. Access layer connectivity is between Gram-Panchayat to Sub-Block node.

ii. Each GP requires at least two OFC path(1CNO) for establishing ring connectivity to protect Gram-Panchayat router's traffic.

iii. The Network shall be made over sub-Block wise with the GPs.

iv. PIA shall provide below listed equipment at each GP but not limited to,

a. IP-MPLS Router with Cards and SFPs,

b. UPS with batteries power backup,

c. Towards Downlink: Mini OLT, Equipments for alternate technologies (FSO/UBR/Aerial OFC-ADSS), Equipments for Revenue Village connectivity (UBR/6F Aerial Drop)

d. Transmission Racks, Earthing, MCBs, FDMS etc.

Note:

For Village Connectivity(Beyond the GP Connectivity):

a. Equipments for alternate technologies for Village connectivity's (UBR/6F aerial drop),
b. Earthing, MCBs, OFC compass etc.
c. Any other additional active,passive equipment as per connectivity medium adopted for revenue village connectivity by the bidder.

v. The above details is for the high level clarification on the bidder's scope, however considering any additional equipment that mentioned (passive/active) require for end deliverables will be in the scope of the bidder without any additional cost to tenderer.

vi. Earthing of any site, GP/Block/Revenue villages should be dedicated and not to use existing earth point for safety and to avoid any harm to network elements/humans. However, equipment working at existing BharatNet network sites like but not limited to, GP /Shelter if in suitable conditions may be use by submission of prior undertaking of safety compliances from the bidder.

vii. GP (Gram Panchayat) nodes shall be connected using a 10G ring architecture, preferably dual-homed, utilizing maximum three 10G GP OFC rings. Each GP ring should be parented on the respective sub-block node.

Category-2: Aggregation Layer (Sub-Block to Master-Block/Sub- Block),

- Aggregation layer connectivity is between Sub-Block to Master-Block/Sub-block.
- Each block requires at least two OFC Path(1CNO) to protect block router's traffic.
- The Routers and RFMS at Sub-block along with configuration, cards and SFPs shall be made over by the PIA.
- Transmission Racks, Earthing & ELCBs (wherever required), MCBs, FDMS etc.

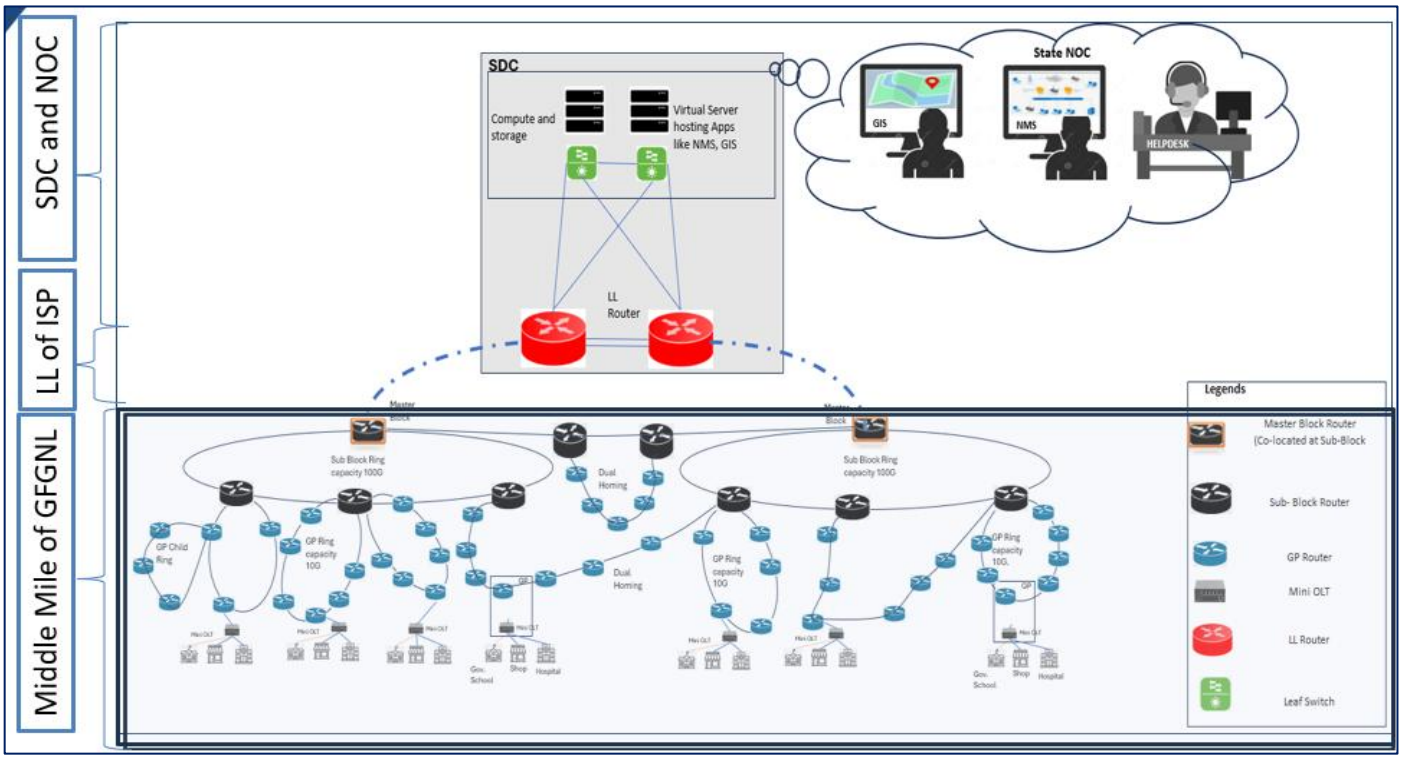
Note:

Sub-Block nodes shall be connected using a 100G ring architecture, preferably dual-homed. One sub-block ring comprising of two/three 100G Sub-Block nodes to be parented on master block in dual home architecture. Maximum two Sub-block ring node should be parented on the respective Master-block node.

Category-3: Express/Core Layer / Master block to SDC

- The Routers and RFMS at Master-block(Co-located at Sub-Block), along with configuration, cards and SFPs for aggregation of sub-block network, for internet breakout at district level shall be made over by the PIA.
- The ILL/P2P link connectivity of master-Block routers to State NOC/SDC shall be arranged by the GFGNL. Further,SDC/State NOC to Central NOC DCN link shall be arrange by GFGNL ~~BSNL~~ for which PIA shall not be charged.

f) A Conceptual connectivity diagram of Phase-III network is illustrated as per below.



g) The PIA shall connect all Gram Panchayat (GP) into dual homed ring topology with IP-MPLS aggregation/ access routers as per the technical specification in this document across the State/UT as per the scope of work through OFC connectivity.

h) The PIA shall design a redundant and robust OFC network infrastructure connecting all GPs, based on ring architecture/ topology. The number of GPs in a GP ring shall normally be around Six (6) to Seven (7). In case, more than 7 (seven) GPs are necessitated to be connected in a ring as per survey, the same shall be implemented after justification and recommendation by the I.E. and approval by GFGNL.

i) The PIA may plan child rings only in case of the creation of GP ring directly from sub-block is not feasible due to distance from sub-block or any other justified reason. The PIA shall conduct a detailed survey and prepare the report for each case and submit it to GFGNL/IE for approval of such Child Rings. Child GP ring is to be parented to one or two feasible GP router. The number of GPs in a child GP ring shall be maximum five (5). However, the overall scope for GP counts in one ring if includes child GP/s, number of total nodes in the GP ring should not be more than 10.

j) GFGNL has already provided connectivity to certain government offices through its existing bharatnet network. The PIA shall conduct and submit a detailed field survey report for these locations without affecting existing connectivity. Based on the recommendations of the Field Officer/Independent Engineer (IE), the PIA may extend connectivity to such sites, subject to compliance with the criteria outlined in this RFP. Connectivity and operation of the said sites will be treated separately as mentioned in the reference clause,i.e., "*Strategic/Other Location Connectivity".*

k) The PIA shall observe the GPs facing frequent power challenges and to take them in Linear topology for less impact on ring topology of GPs to avoid complete blackout and to maintain high network availability.

l) Average number of GPs to be parented at Sub-block shall normally be around twenty-three (23), via multiple of Single/Dual homed access GP rings on separate fiber cores. In exceptional case, after approval of GFGNL/IE it may allow maximum up to thirty (30) with given due justification. For the cases, where it is proposed to connect more than thirty (30) GPs to a Sub-block due to geographical/ technical constraints, the network architecture and design shall require detailed validation and approval by GFGNL/IE before implementation.

m) The PIA shall design a robust, fault-tolerant and high-performance carrier-grade network. Further, it shall ensure availability and reliability of the network as per KPIs. The network architecture must also be deployed to meet the following:

I. Redundancy across nodes and links (ports) to maintain higher uptime.

II. Optimal link utilization

III. Flexibility to allow easy insertion of new node/cards-

IV. From Day-1, the network shall support and enable retail, enterprise, and wholesale services as per the capabilities of the router, such as but not limited to the following:

n) All type of data and voice services, wireless back-haul traffic for 2G,3G,4G, 5G and upcoming 6G services, FTTx- VAS, layer2 VPN, layer3 VPN, point 2 Multipoint VPN and VPLS, IPTV and multicast VPN, Cable TV transmission services along with other bandwidth leasing services supported any to any, one to many, one to one, many to many kinds of services. The network created should have capability to establish end to end integration as per requirement up to State-Wide Area Network (SWAN) and National Knowledge Network (NKN). In this regard, GFGNL shall facilitate in provisioning of all necessary details and access for a smooth integration.

o) GFGNL's endeavor to connect all the villages across the State of Gujarat to foster growth and bridging the digital divide. Service delivery is the key priority for GFGNL.

p) In this regard, bidder has to ensure that technologies to be implemented in network shall facilitate in services with smooth integrations, GFGNL wherever possible may support with all necessary details and access for a smooth integration.

q) Mini OLT deployment shall be mandatory from Day-1 of migration.

Note: The bidder shall propose the appropriate SFP type and reach based on the approved network design, link engineering, and optical link budget requirements and terms and conditions mentioned in the RFP. Equivalent or higher specification SFPs meeting or exceeding the functional and technical requirements may be considered, subject to compatibility with the offered equipment and prior approval of GFGNL/IE on not to compromise in the network services of the GFGNL.

Further, payment shall be regulated as per the applicable SOR and Financial bid quantities provisions, approved design, and actual quantities supplied, installed, and accepted by GFGNL/IE and other applicable terms and conditions of the RFP.

5.10 **ACCEPTANCE TESTING (COMMISSIONING) FOR THE OPTICAL FIBRE NETWORK CONNECTIVITY**

Acceptance Testing Criteria for Dual-Homed Network Architecture

1. General Provisions

1.1 The Successful Bidder/PIA shall carry out installation, commissioning, testing, and final acceptance of the network comprising Gram Panchayat (GP), Sub-block, and Master Block levels in a dual-homed architecture.

1.2 The network architecture shall ensure that:

- Each Gram Panchayat (GP) is Preferably dual homed to two (2) distinct Sub-blocks, and
- Each Sub-block is Preferably dual homed to two (2) distinct Master Blocks, providing redundancy and high availability.

1.3 The connectivity from Master Block to State Data Centre (SDC)/State NOC/BBNL NOC shall be provisioned through third-party ILL/P2P, and the same shall form an integral part of the acceptance testing. Masterblock uplink traffic will be takencare by the LL/P2P service provider, however, maintaing the existing services including TC/DC till the entire service migration on

newly upgraded IP-MPLS will be sole responsibility of the PIA.

1.4 Final acceptance shall be granted only after successful completion of all tests, including redundancy validation, and approval by the State/SIA or its nominated agency.

2. Acceptance Criteria – Master Block

2.1 Scope of Acceptance

2.1.1 The acceptance at Master Block level shall cover 100% commissioning of infrastructure, connectivity, and services, including:

- Preferably Dual connectivity from Sub-blocks
- Upstream LL connectivity to SDC/NOCs
- End-to-end traffic handling capability

2.2 Installation and Commissioning

2.2.1 The PIA shall ensure installation and commissioning of:

- Active network equipment (routers/switches)
- Power supply systems and earthing infrastructure
- Structured cabling and optical fibre termination
- Leased Line termination equipment

2.2.2 All equipment and infrastructure shall comply with applicable standards and specifications defined in the RFP.

2.3 Connectivity and Traffic Testing

2.3.1 The PIA shall demonstrate successful traffic flow from:

- Sub-block 1 to Master Block to SDC/NOC
- Sub-block 2 to Master Block to SDC/NOC

2.3.2 The PIA shall also demonstrate end-to-end connectivity from GP locations through Sub-blocks to Master Block and further to SDC/NOCs.

2.3.3 Traffic shall be tested for:

- Throughput
- Latency
- Packet loss

2.4 Leased Line (LL) Validation

2.4.1 ~~The PIA shall ensure that the LL connectivity meets the Service Level Agreements (SLAs) specified by the service provider.~~ The PIA shall ensure and validate that the LL connectivity meets the Service Level Agreements (SLAs) specified by the service provider.

2.4.2 The LL shall be tested for:

- Minimum committed bandwidth
- Latency and jitter
- Packet loss

2.4.3 In case of multiple LL links, the PIA shall demonstrate automatic failover between ILLs/P2P.

2.5 Redundancy and Failover Testing

2.5.1 The PIA shall conduct failover testing including:

- Failure of one Sub-block link
- Failure of LL link

2.5.2 The network shall automatically reroute traffic through alternate paths without manual intervention.

2.5.3 There shall be no significant service degradation during failover.

2.6 Optical Fibre Testing

2.6.1 The PIA shall carry out 100% testing of fibre links from Sub-blocks to Master Block using:

- Optical Time Domain Reflectometer (OTDR)
- Light Source and Power Meter (LSPM)

2.6.2 Testing shall be conducted at 1310 nm and 1550 nm wavelengths, in both directions.

2.6.3 Acceptance criteria for attenuation shall be following for the 100% OFC cores connected with devices for Master-Block to Sub-Block:

- 1310 nm: 0.34 dB/km + 0.1 dB per splice + 1 dB connector loss
- 1550 nm: 0.22 dB/km + 0.1 dB per splice + 1 dB connector loss

2.6.4 Measured attenuation shall be less than the calculated acceptable attenuation.

2.7 Final Acceptance Criteria – Master Block

Acceptance shall be granted only upon:

- Successful operation of dual upstream links
- Compliance of LL connectivity with SLA
- Successful demonstration of failover scenarios
- Submission of all testing reports and documentation

3. Acceptance Criteria – Sub-Block

3.1 Scope of Acceptance

3.1.1 Sub-block acceptance shall cover:

- Dual connectivity to two Master Blocks
- Dual connectivity to GPs
- Intermediate aggregation functionality

3.2 Installation and Commissioning

3.2.1 The PIA shall install and commission:

- Active network devices
- Power systems and earthing
- Optical fibre links (upstream and downstream)

3.3 Connectivity and Traffic Testing

3.3.1 The PIA shall demonstrate connectivity:

- From GP to Sub-block
- From Sub-block to both Master Blocks

3.3.2 Traffic shall be tested across both upstream paths independently.

3.4 Redundancy and Dual-Homing Validation

3.4.1 The Sub-block shall demonstrate:

- Simultaneous connectivity to two Master Blocks
- Redundant connectivity for all GPs

3.4.2 Routing and switching configurations shall ensure stable and loop-free operation.

3.5 Failover Testing

3.5.1 The following scenarios shall be demonstrated:

- Failure of one Master Block connection
- Failure of GP link

3.5.2 Traffic shall automatically reroute through alternate paths.

3.6 Optical Fibre Testing

3.6.1 The PIA shall perform OFC testing for:

- GP to Sub-block links
- Sub-block to Master Block links

3.6.2 Testing requirements and acceptance criteria shall be as specified in Clause 2.6.

In case, New OFC Work , 100% Core shall be healthy.

For Old OFC existing path from Sub-Block to GP atleast 50% terminated OFC Cores(Clause 5.6 of Fibrization and design principles) and For Sub-Block to Sub-Block minimum 80% terminated OFC Cores (Clause 5.6 of Fibrization and design principles) shall be healthy.

*In case, 100% terminated cores are healthy will also be accepted.

*Above OFC health readiness are designed for acceptance criteria, However, during the O&M Phase 100% OFC cores shall be healthy as per the Clause defined in (5.23.3.2 (a)VII (a)).

3.7 Final Acceptance Criteria – Sub-Block

Acceptance shall be granted only upon:

- Operational dual connectivity to Master Blocks
- Successful GP connectivity
- Successful failover validation
- Compliance of all fibre links with attenuation criteria

4. Acceptance Criteria – Gram Panchayat (GP)

4.1 Scope of Acceptance

4.1.1 The acceptance at GP level shall include complete commissioning of dual connectivity to two Sub-blocks.

4.2 Installation and Commissioning

4.2.1 The PIA shall install and commission:

- Customer premises equipment (ONT/router etc.)
- Power systems and earthing
- Fibre connectivity to both Sub-blocks

4.3 Connectivity and Traffic Testing

4.3.1 The PIA shall demonstrate connectivity from GP to:

- Sub-block 1 and onward to Master Block and SDC
- Sub-block 2 and onward to Master Block and SDC

4.4 Dual-Homing Validation

4.4.1 Each GP shall have:

- Two independent fibre paths to separate Sub-blocks
- Capability to transmit traffic over both paths

4.5 Failover Testing

4.5.1 The PIA shall demonstrate:

- Failover from primary Sub-block to secondary Sub-block
- Restoration of traffic upon link recovery

4.5.2 There shall be **no prolonged service interruption during failover**.

4.6 Optical Fibre Testing

4.6.1 100% OFC links shall be tested using:

- OTDR
- LSPM at 1310 nm and 1550 nm

4.6.2 Acceptance criteria shall be as defined in Clause 2.6.

For New OFC Work , 100% Core shall be healthy.

For Old OFC existing path from GP-to – GP or GP to Sub-Block atleast 50% terminated OFC Cores(Clause 5.6 of Fibrization and design principles) shall be healthy.

*In case, 100% terminated cores are healthy will also be accepted.

*Above OFC health readiness are designed for acceptance criteria, However, during the O&M Phase 100% OFC cores shall be healthy as per the Clause defined in (5.23.3.2 (a)VII (a)).

4.7 Final Acceptance Criteria – GP

Acceptance shall be granted only upon:

- Successful dual connectivity to Sub-blocks
- Successful failover testing
- Verified end-to-end connectivity to SDC/NOCs
- Compliance of fibre links with attenuation norms

5. Documentation and Certification

5.1 The PIA shall submit the following:

- Installation and commissioning reports
- OTDR and LSPM test reports
- Failover test reports
- Traffic test results
- As-built network diagrams

5.2 All reports shall be certified and submitted to the State/SIA or its nominated agency for approval.

6. Final Acceptance Condition

6.1 Final acceptance shall be granted only if:

- 100% network components are commissioned
- All dual-homing conditions are satisfied
- All links pass optical and performance criteria
- All failover scenarios are successfully demonstrated
- LL connectivity meets SLA requirements
- Complete documentation is submitted and approved

6.2 Any deficiencies identified during testing shall be rectified by the PIA at no additional cost, and the system shall be subjected to re-testing prior to acceptance.

Note:

The above are indicative information for acceptance testing, however, based on the network architecture and execution, a separate SOP will be shared for which the selected bidder has to adhere and accordingly the related milestones will be measured.

5.11 SITE PREPARATION AND SPACE UTILIZATION

a) Use of Existing Infrastructure

- Bidder must utilize existing space and infrastructure available at GFGNL-owned shelters or BSNL exchanges based on terms and conditions mentioned in the tender.
- Any additional infrastructure requirements (e.g., racks, cabling, power arrangements) shall be borne by the bidder.

b) SDC Site Requirements

- Space and Power Provision: GFGNL will provide space, power, and server storage at the SDC (State Data Center) end.

- Bidder must install all required software and equipment as per the proposed solution.

I. Rack Space Allocation

- Considering associated cost of space and power in data center, bidder to ensure optimal design of core nodes.
- ~~For EMS integration with other tools, required space and compute resources including DC power sources will be arrange by the GFGNL at SDC-Gandhinagar/ any other locations. However, selected bidder will be solely responsible for the connectivity from the EMS to NMS.~~
- The bidder is responsible for providing telco-grade rack including it's mounted AC-to-DC power plants with redundancy at the SDC and will be installed in Racks.
- For EMS, Bidders shall host the application at HCI . Further GIS and NMS apllication are to be hosted at SDC compute resources. The AC power sources will be arrange by the GFGNL at SDC-Gandhinagar/ any other locations. However, selected bidder will be solely responsible for the connectivity from the EMS to NMS.

II. Power and Earthing

- The bidder must extend power and earthing from existing power points or tapping locations on its own.

5.12 SCOPE OF WORK FOR BSNL EXCHANGE / SHELTER

I. GFGNL site offices are located at District, Taluka, Gram Panchayat. Shelter covering the widespread area of Gujarat for network connectivity, where this telecom industrial grade shelters are the critical sites for GFGNL network.The overall scope is divided into two different parts,

a) **Existing Shelter of BharatNet Phase-II Infrastructure Upgradation**: As mentioned, GFGNL has already developed ~410 telecom grade Shelter/ Government PoP infrastructure in BharatNet Phase-II project, selected bidder has to take takeover existing Shelter infrastructure and upgrade the various infrastructure as mentioned in the scope of work of this RFP. The bidder will be responsible to take over existing porta cabin/Shelter's along with it's active and passive equipments(existing as well as newly upgraded line items) and provide onsite comprehensive warranty for entire 10 years of contract duration. The Bidders are free to do the field survey and collect the inventories details of expired AMC, repair and replacement items before the pre-bid meet and quote the amount final bid submission. Selected Bidder shall ensure accurate GIS mapping of shelter locations and assets alongwith completeness and correctness of project documentation.

b) **Inhousing Sub-block equipments at BSNL Exchange/ Developing new Shelters**: The BharatNet Amendment Program intends to merge and upgrade both Phase-I and Phase-II of the BharatNet Program (covering approximately 14,737 GPs across 34 districts of Gujarat), as well as expanding it to connect the remaining Gram Panchayats (GPs) and villages. The foremost priority of in-housing sub-block equipments shall be in **BSNL existing exchange**, however, the location should be define at the time of initial survey and based on recommendation of IE ~~and~~ / GFGNL field officer for better governance, GFGNL may approve the requirement to built the new shelter or inhousing equipments at BSNL Exchange.

II. Bidder must communicate to GFGNL official at H.O.-Gandhinagar and local GFGNL official with their authorized persons list with their contact details. The visit details should be in prior intimation atleast one day before the schedule date and subject to permission and availability of end site, in written including time schedule and location details.

III. For the new build shelter(if in case required), Selected bidder will have to design, supply, install, Testing and commission (SITC) Infrastructure including but not limited to porta cabin/shelter, ACDB (AC distribution box), DCDB, AC, SMPS, battery bank, earthing strips, earthing pits, Servo Stabilizer etc. under this RFP scope at any Govt. premises(to be decided by GFGNL) at Blocks/Talukas or as per GFGNL's requirement. Selected bidder will also have to carry out required civil work to install shelter /porta cabin as per the details provided in specifications below and all related electrical cabling work for successful commissioning of all electrical equipment's.

IV. Selected bidder(s) will have to design, supply, integrate, testing, commissioning, of all shelter infrastructure with all related active and passive equipments at the locations within Gujarat as per requirement of GFGNL and responsible for completion of FAT and AMC/warranty for O&M as describe in this RFP during the entire contract duration.

V. **Existing Shelter Infrastructure / Government PoP need to consider for Upgradation details are as follows,**

To maintain high network uptime and monitor the resources installed at shelter remotely, the Bidder must do upgradation of existing shelters for BharatNet. The existing shelters of Phase-II are in numbers and distributions are given as under:

Sr. No.	Description	Total (BharatNet Phase-II)
01	Shelter Qty	~410

VI. Similarly, the inhousing of sub-block equiments at BSNL exchange/ additional proposed shelter during the amendment BharatNet Program Phase-III will be as under,

Sr. No.	Description	Total
01	Shelter Qty	~280

VII. The quantities given above are indicative and may vary based on the site clearance and feasibility of the ABP Phase-III network and validation of design by IE/GFGNL.

VIII. The Bidder shall be responsible for the retrofitting of the existing and newly integrated /establishment of new shelters / BSNL exchanges (BharatNet inventories) as per the requirement and complying with all the terms & conditions of this RFP.

IX. The bidder shall provide comprehensive onsite warranty support for Shelter sites with associated accessories and electrical work carried out by the bidder during the entire contract duration which include repair or replacement of the faulty items at no additional cost within defined SLA.

X. Arrangement of mobile D.G. (Diesel generators) set, which are essential for providing reliable backup power to BharatNet infrastructure will be in bidder's scope in the critical outage

conditions like but not limited to force majure like heavy cyclone, rain, or any local authority declaration on power outage, etc.

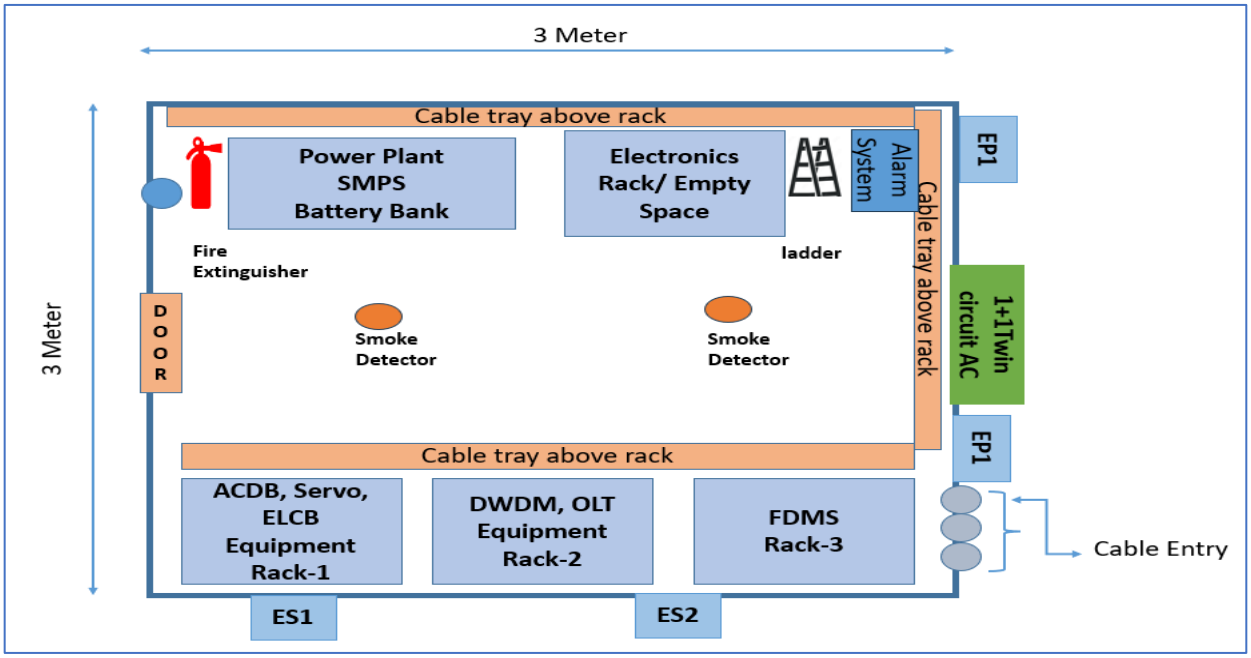
XI. Apart from SoR/ Financial bid line items if anything is required in terms of component, Manpower, any hardware-software then the bidder needs to consider in financial bid cost and bidder needs to mention the detail of Items in the unpriced BOM/BOQ submitted along with the bid response.

XII. Bidder has to provide dedicated SPOC(Single point of contract) for shelter infrastructure/ Sub-Block(BSNL Exchange) site during the entire contract duration with end to end responsibility of locations to drive the project, assigning activities to their field & back office resources, material movement, co-ordination with various stakeholders, submitting required documentations including permission-AMCs, warranty certificates, attend meeting with various stakeholders, etc. for entire contract duration from the date of assigned WO including the O&M phase for ticket handling, rectification and resolutions of faults.

XIII. The all the High level Diagram/Design(HLD) and Low Level Diagram/Design(LLD) of each component and their wiring for each shelter needs to submit at GFGNL HO, Local Office and also need to stick on Shelter with clear visibility. Any modifications or change should be inform to GFGNL and submit latest updated copy to GFGNL within week of change.

XIV. The bidder is solely responsible to extend the all-network performance alarms of equipments installed under the shelter till GFGNL SNOC/SDC, through network equipment installed at site where only single interface (RJ45), other related infrastructure including but not limited to alarm system, other hardware and/or software will be in the scope of the bidder without any additional cost to GFGNL.

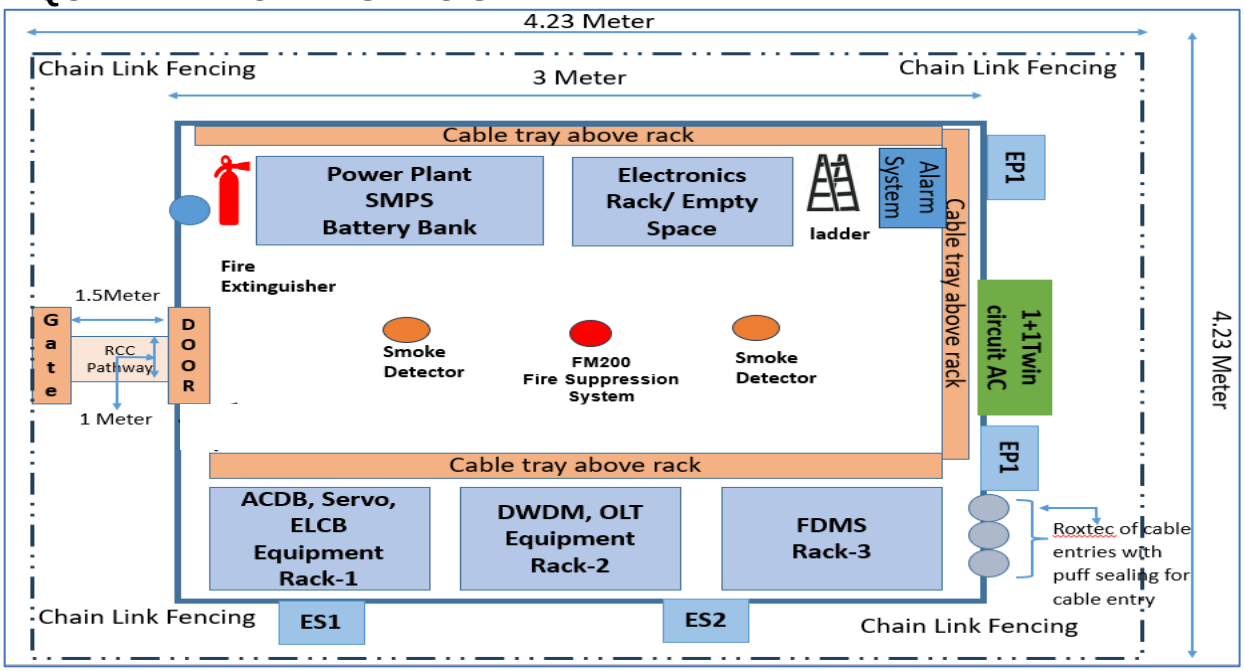
5.12.1 INDICATIVE EXISTING SHELTER DIMENSIONS



Drawing:01 Existing Shelter Indicative Diagram

5.12.2 INDICATIVE NEW SHELTER DIMENSIONS (IF INCLUDING UPGRADATION

REQUIREMENT OF EXISTING SHELTER



Drawing:02 New Shelter Indicative Diagram

XV. Insurance, warranty, security of goods/resources supplied will be under the scope of selected bidder for the entire contract duration without any additional cost to the GFGNL.

XVI. Although at GFGNL existing shelter infrastructure do have their dedicated EB meter, However for new sites if in future require to build, taking permission and installation of separate EB meter with related accessories like ECB, etc for telecom grade shelter with applicable laws and local policy will be in the scope of bidder.

XVII. When constructing a foundation for a new shelter(if in case), it's crucial to consider several following factors to ensure safety and stability but not limited to,

a. **Load Bearing Capacity of Soil**: This refers to the soil's ability to support the weight of the structure without experiencing failure. Different types of soil have varying load-bearing capacities, and it's essential to assess this to determine whether a shallow or deep foundation is needed.

b. **Seismic Load**: This involves the forces exerted on a structure during an earthquake. Seismic load calculations take into account factors such as ground motion, soil type, and the building's weight and dynamic characteristics.

c. **Wind Load**: Wind load refers to the pressure exerted by wind on a structure. It includes uplift, shear, and lateral forces, which must be considered to prevent structural failure, especially in areas prone to high winds.

XVIII. Similarly, For rooftop installations at shelter/building, following additional considerations needs to include but not limited to,

Shelter Load Bearing Capacity: The existing structure's ability to support additional weight from the new installation must be evaluated. This includes the weight of the new shelter, equipment, and any live loads such as people or rain or etc.

Structural Stability: Ensuring that the shelter can maintain its integrity under the added loads and environmental conditions is critical. This involves checking for adequate support, and overall design to withstand both static and dynamic forces.

XIX. Bidder shall have to submit the soil testing / structure stability testing report/certificate for each site before start of work from Government approved agency.

XX. Following minimum activities shall be required to complete by the selected bidder on discovered cost for the existing shelter sites as a part of existing shelter upgradation. Similarly, Bidder has to ensure for new shelter development should also consider these line items:

i. Fencing of Shelter area including wiring mesh(2mm) with GI Pole with anti-rusting coated paint along with RCC foundation.
ii. Erection of main gate for shelter entrance.
iii. Construction of Reinforced Cement Concrete (RCC) for pathway in between main gate and shelter gate / in between the water blockage areas.
iv. Stonework / plaster in between space/surrounding of shelter till boundary wall/main gate to be done by the bidder.
v. End to end structured electrical wiring with accessories such as casing capping/ Conduit, mounting clamp, MCB etc. (from raw power to UPS/Power Plant or wherever applicable).
vi. SITC of manual change over switch.
vii. FM200-Fire Suppression System/Clean Agent (auto actuator).
viii. Fire Extinguisher Cylinder.
ix. Base of the shelter if damage, need to replace with waterproof and fireproof cement fibre sheet.
x. Bidder has to consider approximately 5% cases for increasing the height of existing shelter.
xi. Upgradation of existing battery banks with suitable make and model of existing infrastructure.
xii. The conversion of Single-Phase Servo Stabilizer to Three-Phase Servo Stabilizer shall be undertaken entirely at the cost, risk, and responsibility of the successful bidder. The scope of work shall include, but not be limited to, complete Single-Phase to Three-Phase electrical system upgradation, including:

- Supply, installation, testing, and commissioning of Three-Phase ELCB;
- Laying and termination of Three-Phase power cables from EB Meter to ACDB and from ACDB to SMPS;
- Provision and installation of all associated accessories such as Three-Phase MCBs, ELCB box, connectors, terminations, and any other components required for successful and safe operation;
- All services, including manpower, tools and tackles, statutory compliances, transportation, installation, testing, and commissioning.

The above scope shall be deemed to be inclusive and shall be quoted as a discovered price in the Financial Bid Schedule.

Please note that, above shelter / PoP upgradation requirements are indicative and may be assign based on the requirement case to case basis.

The conversion work shall be completed within seven (7) calendar days from the date of issuance of the intimation order by GFGNL. In case of delay beyond the stipulated completion period, delay penalty should be at the rate of 2% of the discovered cost of the Three-Phase Servo Stabilizer per week or part thereof, subject to a maximum ceiling of 10% of the total value of the Three-Phase Servo Stabilizer.

xxi. As mentioned above, the first priority for in-housing of sub-block inventories shall be at existing BSNL exchanges where GFGNL shelters are not available. At BSNL exchanges, provision of space and power infrastructure shall be out of scope of the selected PIA. However, extending power cable from the nearest available power source to the sub-block router/equipment shall be the sole responsibility of the PIA. In case any additional infrastructure is required, such as SITC of transmission rack, internal/external wiring, MCB/ACDB/DCDB, etc., the same shall be arranged, installed, and integrated by the PIA with prior approval from GFGNL officials and the concerned BSNL authority.

xxii. Furthermore, wherever approved by GFGNL for new shelter to be build, the minimum deliverables for new shelter (if approved by GFGNL) site will be as mentioned below, However, based on the site conditions and field requirement it may vary with approval of GFGNL/IE.

a) SITC of Porta cabin including Roxtec of cable entries with puff sealing for cable entry
b) SITC of Switch Mode Power Supply (SMPS) of 16KW
c) Rectifier Module (80 amp (2 Qty))
d) SITC of Battery Banks (Lithium Ion) of 600 AH with battery management system.
e) SITC of commercial grade Air Conditions (AC)-2 ton.
f) SITC Of Split AC with controller module- for the site co-located at TC/DC or as per GFGNL decided location/s only.
g) Earthing Pit with all required materials separately.
h) DCDB and ACDB
i) Single or Three Phase Servo Stabilizer including internal wiring.
j) Fencing of wiring mesh(2mm) with GI Pole along with RCC foundation.
k) Entrance Gate for shelter.
l) Fencing of Type-2 boundary wall with plaster.
m) SITC of manual Change Over Switch.
n) FM200-Fire Suppression System/Clean Agent.
o) RCC pathway in between main gate and shelter gate (in sq. ft.)
p) Cable Tray internal as well outdoor for OFC cable routing upto roxtac.
q) Ladder-Aluminum
r) Alarm System
s) Fire Extinguisher
t) Base of Shelter
u) Emergency Light
v) Smoke Detector
w) Cable Tray

x) Lightening Arrestor

vii) Final Acceptance Test(FAT)

a. The primary goal of acceptance testing is to ensure that the work (including all the components as mentioned in the shelter scope section meets requirements, standards, specifications, and performance, by ensuring that the following are associated with clear, quantifiable metrics for accountability,
   - Infrastructure Compliance
   - Performance
   - Project and O&M Documentation
b. The Successful bidder shall inform the department in writing including the IE, as and when the work is completed for a specific work order, with the request to conduct acceptance test(AT).
c. The bidder shall bring all the testing equipment to site as required under the procedure to carry out testing at no extra cost to GFGNL. Bidder to submit calibration certificate of test equipment's prior to AT.
d. The Bidder shall be fully responsible for providing end-to-end technical and field support to GFGNL and the IE team. This shall include qualified manpower, calibrated tools, testing instruments, consumables, and any other resources required for execution and verification of works. All measuring and testing instruments should be in working condition and shall carry valid calibration certificates issued by NABL-accredited or equivalent recognized laboratories, which shall be produced on demand and also support .
e. The bidder shall co-ordinate and carry any other required test as desired by purchaser without any further cost to GFGNL.
f. Any procedure delay for approval of AT acceptance by GFGNL/IE, shall not be considered as delay on bidder's part.

viii) It shall be the Bidder's responsibility to supply, install, integrate, test, commission, and make operational the upgraded shelter sites as well as the newly created sites(if applicable), including all associated devices/components and their spares, in accordance with the technical and contractual requirements.Successful completion of the relevant milestone shall be demonstrated through completion of Factory Acceptance Test (FAT) and Site Acceptance Test (SAT), as applicable.

ix) Further, the Bidder shall provide **comprehensive Annual Maintenance Contract (AMC) support for a total contract duration of ten (10) years**, inclusive of implementation period~~,~~and O&M support, ensuring continuous performance, uptime, and serviceability of all supplied assets throughout the contract tenure, at no additional cost to GFGNL beyond the agreed contract price for both the newly and upgraded shelter infrastructure and its components.

x) **Spare Availability:** The PIA shall keep the required spares for meeting the SLA defined in Section 7. The PIA shall have an agreement with all the OEMs for supporting the supplied products for the life time of the contract (10 years). The OEM shall be bound to supply the spares to GFGNL during the entire contract period as per the MAF on the same commercial terms and conditions.

In case any equipment is not repairable due to non-availability of the spares, PIA shall replace the supplied products with equal or upgraded/ higher version during life time of contract (10 years) at free of cost"

xi) Bidders' obligations during the-contract duration are mentioned below,

I. Preventive maintenance of the deployed equipment well in advance without fail,
II. Pre-monsoon maintenance, water leakage /seepage test and conformation,
III. Monthly visit to each shelter for wear and tear, cleaning, safety check,
IV. Quarterly fire and electricity safety test,
V. Signage board of "Gujarat Fibre Grid Network Limited/ BharatNet"(as per the further communication by the GFGNL) and appropriateness.

xi) If any fraudulent activity by the personnel deployed during the entire contract for maintenance activities will be detected by GFGNL authorized personnel/officer/authorized agency, then the bidder is liable to pay penalty i.e., the cost of consequential damages to installation(s) would be deducted at actual, from the bidder's bill.

xii) Selected bidder will be a guardian of the telecom infrastructure site.

xiii) As the DISCOM process is already online and GFGNL will support administratively wherever required. However, in worst case, selected bidder may need to support for electric meter box, their application submission, collection and payment of the electricity bills and handing over the same to the site in charge of GFGNL on time.

xiv) GFGNL existing sites under BharatNet Phase-II are currently provisioned with electricity meters at Shelter Sites and, in certain cases, common connections with Gram Panchayat buildings. However, based on future requirements, GFGNL may direct the migration to dedicated electricity meters/smart meters at each site through the respective DISCOM/electricity authority. The selected PIA shall extend necessary support and coordination for such migration, as required.

xv) The fixed monthly charges for each electricity connection will be based on the load capacity of the network equipments and rural/ industrial / special electricity tariff, whichever is lowest. The PIA shall ensure that, in cases where a dedicated electricity meter is provided, only network equipment is connected to such meter. The PIA shall be fully responsible for preventing any unauthorized usage, misuse, or fraudulent practices related to electricity consumption at the site.

xvi) PIA shall be responsible to cooridnate and integrate electricity connection through Discoms at GP for the network equipments under BharatNet including all other accessories like but not limited to ELCB,MCB, electric wiring,etc. However, one-time electricity meter charges shall be borne by GFGNL under BharatNet Project Priority electricity connections (To ensure highest availability of power) along with smart electricity meters .Meeting with concern stakeholders/authority to get the work done will be in bidder's scope.

xvii) PIA may apply for electricity connections through single application for multiple Locations or as per the need on the name of "Gujarat Fibre Grid Network Limited". The centralized bill as per fixed monthly charges for all electricity connections may be generated by State Agency/Discoms. GFGNL shall make centralized payment for all electricity connections for which necessary provisions may be made by the Discoms/ State electricity Agency.

xviii) Selected bidder will have to carry out any other miscellaneous work related to the shelter infrastructure assigned by the concerned GFGNL Officer.

xix) Adherence to guidelines and procedures laid down by GFGNL for proactive maintenance.

xx) Selected Bidder will also have to maintain the fire extinguisher/safety materials in working condition during the entire contract period with atleast 1 year valid date with required certification. Further,timely change and installation of fire extinguisher before the expiry date will be in the bidder's scope.

xxi) The Bidder, during the initial planning stage, shall ensure the suitability and finalization of shelter locations (on alternate to BSNL exchange site) near by BSNL exchanges and requirements in accordance with the approved technical architecture, duly considering existing shelters and the quantities defined under the scope of this RFP. This shall be carried out through joint on-field visits and concurrence with GFGNL and all stakeholders involve in this activities. Any requirement for shifting arising due to improper planning, incorrect technical solutions, or at the Bidder's discretion shall not be entertained, and all associated costs shall be borne entirely by the Bidder. However, if required in future and instructed by GFGNL, the selected Bidder/PIA shall undertake shifting of shelter infrastructure sites (including all civil, non-IT, IT items, and components supplied and installed under the Scope of Work of this RFP) from one location to another within a 50 km radius.For such approved shifting, GFGNL shall pay**, as per the discover cost in the price bid** inclusive of dismantling, transportation, re-installation, commissioning, and acceptance testing of both active and passive equipments.The Bidder/PIA shall complete the shifting, commissioning, and acceptance within 30 calendar days from the date of instruction.

However, Shifting from existing BSNL exchange to new built shelter will be in the scope of PIA for which ₹15,000/- per site(including all active and passive inventories SITC) including Taxes will be paid to the PIA.

xxii) **Upkeep of Power plant equipment:**

The bidder will do proper upkeep at least once in a month at each station which will consist of (but not limited to) of the following and submit the report monthly to GFGNL office:

1. Testing of manual changeover of SMRs (Switch Mode Rectifier).
2. Checking of current setting as per load.
3. Checking of input & output voltages and recording the same as per format given in the maintenance manual/ format provided by GFGNL.
4. Checking of extension and reporting of alarms to NMS, whenever & wherever provided by the tenderer.
5. Checking of proper connection of input and load cables and on cables from where distribution provided.
6. Any other assignment as felt necessary during the contract duration for better network uptimes.

xxiii) Upkeep of Battery Set (VRLA & Li-Ion batteries)

1. Checking and recording of individual cell voltages as per format given in the maintenance manual/ format provided by GFGNL.
2. Cells whose voltages/conductance is found to be below prescribed value should be noted and replaced as per GFGNL's Engineer advice.

3. Checking of battery voltages at equipment end.
4. Checking of proper connection of load cables including tightening of bolts.
5. Cleanliness of battery cells and bank.
6. Checking of sulfation /physical damage/leakage.
7. Any other assignment as felt necessary during the O&M phase.

xxiv) **Upkeep of Air Conditioners:**

1. Function checking, necessary adjustments, filter checking/cleaning, servicing etc. of AC and change over unit at least once in once months' time (if required more frequently).
2. In case of malfunction of AC machine, change over unit, corrective measures have to take to attend/rectify the failures.
3. Any Air Conditioner machine or its spare parts taken for repairing/ replacement should be returned reinstalled by the AC mechanic.
4. Certified Engg. from OEM should attend it as warranty may become void if any other technician repairs it.
5. The full functioning of change over unit, wherever provided, should be checked once in a quarter. Bidder has to ensure temperature inside shelter from 22°C to 30°C.
6. A history register is to be maintained to keep record of repair/repairable spares, schedule breakdown details etc.

xxv) **Upkeep of Shelters:** The PIA will do the proper upkeep of shelter once in one months' which will consists of (but not limited to) of the following:

1 Hecking of leakage of water, roxtec of cable entries with puff sealing and repairing of the same.
2 Tightening the nut & bolt of the shelters, if required.
3 Minor repair of shelter.
4 Checking of condition of doors & locking arrangements
5 General cleanliness of shelter.
6 Any other assignment as felt necessary during the O&M phase.

xxvi) **Upkeep of Earthing:** The PIA will do the following activities as per schedule given below:

1. Watering of the earth pits on every visit (at least once in a month).
2. Checking of the physical connections at equipment ends.
3. Tightening of nut/bolts once in a quarter.
4. Measurement of earth resistance once in six months under supervision of GFGNL Engineer. At least one measurement shall be done during peak summer & measure the desired value as mentioned in the RFP.

xxvii) Takeover and Handover of Shelter

Selected bidder will be responsible to take over existing porta cabin/Government PoPs/shelter's infrastructure developed under BharatNet Phase-II alongwith it's active and passive inventories within the process and timelines defined in the handover, takeover process sections.

Responsibility of the bidder after takeover of the existing shelter/porta cabin infrastructure/ Government PoPs of bharatnet Phase-II will be as per following but not limited to:

- complete existing setup knowledge gaining of shelter infrastructure, preparation and submission of Operating Manuals and SOP's

- Network inventory details.
- Installation and configuration details of hardware and software deployed by the bidder including Low Level Design and High-Level Design.
- Comprehensive onsite warranty and AMC of all shelter infrastructure for entire contract duration.
- Detail understanding on troubleshooting and debugging.
- Insurance of the site(if not needs to procure by bidder).
- Providing SPOC for entire contract duration For implementation , O&M period, access and other support).
- Contact details of OEM and bidder representative for onsite warranty and back-to-back OEM support for entire contract duration.
- Additional material integration as mentioned in the scope of work of RFP.
- Checking the health of all inventories and upgrade the inventories like battery bank on 5 years warranty and 2 years extended onsite replacement warranty with approval of GFGNL to improve the performance.
- Any other details required to gather the complete knowledge as a part of handover takeover process, that may be required/asked by GFGNL.
- GFGNL will support administratively wherever possible.

xxix) Other Parameters For Shelter

a) Selected bidder shall make arrangements to upgrade the existing GFGNL shelter.

b) The supplied Devices and its parts by selected bidder shall be new, unused, of the most recent or current model and they incorporate all recent improvements in design and / or features.

c) Bidder has to ensure firmware upgrade time to time during contract period and OEM through bidder or new bidder of ABP BharatNet Phase-III PIA(after handover takeover process) during 10 years after completion of successful FAT.

d) Selected agency shall apply for electricity meter in name of GFGNL to the concerned electricity provider and shall take follow up until the connection is provided. Delay on account of electricity connection time will be exempted from delay penalty. Selected agency shall make arrangements to install the meter nearby the porta cabin with necessary accessories in weather proofing Box.

e) GFGNL will support administratively wherever feasible and pay electricity bill as per actuals post installation.

f) QA/QC certificate from the respective OEM for the Battery, Powerplant, AC has to be provided by bidder for the deployed product at site.

g) OEM shall ensure that all equipment/components/sub- components being supplied by them shall be supported for atleast for coming 10 years from the successfully completion of FAT. If the same is de-supported by the OEM for any reason whatsoever, The bidder shall replace it with an equivalent or better substitute that is acceptable to tenderer without any additional cost to the tenderer and without impacting the performance of the solution in any manner whatsoever.

h) Post award of work order, for any reason, if OEM fails to supply or doesn't support, then permission will be given to replace it with an equivalent or better substitute, which conforms to the specifications as in current RFP - subject to such product being acceptable to the tenderer without any additional cost to the tenderer and without impacting the performance of the solution and time line of the Project in any manner whatsoever subject to levy of a penalty of 1% of the of the Capex cost of pending work subjected to GFGNL's competent authority approval.

i) All safety equipment required for installation and commissioning shall be provided by the bidder.

j) Selected agency shall have to do the location marking jointly with GFGNL and its authorized agency at Govt. Premises before starting the work and submit the joint visit documentation to GFGNL head office.

k) Selected agency will have to showcase first porta cabin infrastructure at proposed location as prototype and get GFGNL team's approval before proceeding for other locations.

l) Selected Agency will have to do the necessary changes as suggested by GFGNL team in the prototype site and then only proceed for further locations.

m) Bidders have to take care of all safety precaution during installation and commissioning of all supplied equipment's at site.

n) Selected agency shall supply all required accessories for installation, commission & testing of installed Devices and its parts.

o) Selected agency shall supply and install ISI mark electrical cables (Preferable make: Finolex, Polycab, RR Kabel, Havells or its equivalent) with >5 sq.mm. with suitable and compatible lugs as per load required for interconnection between different electrical components(including but not limited to) i.e. SMPS, Meter box, battery bank, AC and till power panel of all racks to enable PIA teams to install the proposed electronics devices. Bidder will have to use ISO standard compliant Electrical cables.

p) Electronic Equipments installed shall be DC and will run on -48 VDC.

q) Samples of all prefabricated panels and other fitments will be provided and approved before commencement of the work.

r) Selected agency will also have to construct minimum 2 earthing pits each for earthing of electrical & electronic equipment's per site near to shelter connected in grid with plate/chemical earthing. Dimension of earthing plate should be minimum 600 mm * 600 mm * 5 mm. Both earthing pits will be connected in grid. There will be 2 such separate grids (total 4 earthing pits) for electrical & electronic equipment's. All material and hardware's to be supplied by the contractor shall ne new, unused and of best quality and shall conform to the specifications given here under and to latest specifications of BIS.

s) All Earthing system elements (Like earthing plate, earthing strip etc.) should be of copper for electronic earthing. & same should be of chemical earthing. Two Earthing pits for Electronics with copper plate & Two earthing pits for Electrical Earthing with chemical earthing needs to be constructed. Chemical earth electrode (Strip-in-pipe Technology): Strip in pipe technology concept involves GI Strip inserted inside the GI pipe. Both are subjected to Hot dip galvanization of minimum 250 microns after fabrication. The empty space in the pipe shall be filled with a specially developed

crystalline conductive mixture. For uniform distribution of fault currents an earth electrode must be cylindrical in shape.

t) Earthing value should be <=0.5 Ohm for electronics equipments & <=5 Ohm for electrical equipments.

u) Bidder shall allow to install any additional rack (as per space feasibility), any additional equipment inside existing rack, laying & installation of any additional optical fibre cable through its vendors/contractors with approval of GFGNL. GFGNL will also have rights to allow any 3rd party /organization to install its rack, its equipment inside GFGNL's rack and laying & installation of optical fibre cable within shelter / porta cabin. Non-discriminatory access including leasing of dark fibres shall be provided to Service Providers. If required, selected bidder will be informed 24 hours prior for any such Third-party activity and PIA has to support accordingly.

v) The rates quoted by the bidder shall include transportation, loading/unloading and labour charges for all scope of work mentioned in this RFP. No additional payment other than what has been quoted for in the tender shall be payable to the selected bidder under any circumstances.

w) Bidder shall have to print the name of the tenderer and /or logo on each Porta cabin/Shelter at each infrastructure site.

x) Bidder shall have to provide onsite support within 24 hours of intimation given by GFGNL on call/e-mail for any issues.

y) Date of completion shall be the date on which completion certificate is issued to the agency by GFGNL which shall only be done after rectification of defects, if any pointed out by the GFGNL or its authorized agency to the selected bidder / his contractor / his representative.

z) Post award of Work order for respective infrastructure site, GFGNL will do acceptance post completion of work by successful bidder at site. Post AT clearance acceptance Memo will be issued by GFGNL. Post that it will be handed over to GFGNL. GFGNL will align for acceptance within 96 hours post offer of AT for infrastructure site by selected Bidder.

aa) Machinery, equipment, implements, material and consumables proposed to be used to fulfill the scope of work of this RFP should be clearly indicated and will be selected bidder's responsibility.

bb) All accessories required for porta cabin as per scope of work of this RFP needs to be supplied.

cc) Manual each of all electrical equipment's will be provided per site mentioning process for installation and commissioning of equipment including configuration, operational procedure for preventive & reactive maintenance and do's & don'ts.

dd) As per labour law of Government of India, labour license and other liabilities are sole responsibility of the bidder and GFGNL will not be responsible for any labour law liabilities.

ee) In case of physical damage done to shelter/Porta cabin or any other infrastructure components post installation and commissioning at any infrastructure location; Bidder shall have to support for restoration. GFGNL will pay for same as per actuals based on the insurance covered and payment released by insurance company.

ff) GFGNL shall arrange to maintain appropriate environmental conditions, such as those relating to space, temperature, power supply at Site Office.

gg) The rates quoted by the bidder shall include transportation, loading/unloading and labour charges for all scope of work mentioned in this RFP. No additional payment other than what has been quoted for in the tender shall be payable to the selected bidder under any circumstances.

hh) Bidder shall have to print the name of the tenderer and /or logo on sticker and paste on each Devices and its parts at site.

ii) GFGNL will align for acceptance within 96 hours post offer of AT by selected Bidder.

jj) Selected Bidder shall ensure that there is no loss or damage to the property of shelter or at premise selected by GFGNL while executing the Contract. On account of any negligence, commission or omission by the engineers of the Bidder/OEM and if any loss or damage caused to the Equipment's /servers / other devices, the Bidder/OEM shall indemnify /pay /reimburse the loss suffered by the GFGNL.

kk) All hardware / software/AMC/ Warranty procured against this bid should be in the name of GFGNL or DBN or DBN/CCA-Gujarat written instruction from GFGNL in-line with provided guidelines from GoI.

ll) The bidder to ensure removal of waste (Packaging material, boxes, waste etc.) within 2 days post installation at site at own cost.

mm) Bidder should also have to provide the Spoke person from his end as well as contact details of all OEMs along with escalation matrix along with time-to-time updation in same to GFGNL.

nn) Quoted price must include expenses for transportation, loading & unloading and packing & unpacking at sites.

oo) Non-availability of the stock should be informed in writing immediately.

pp) No part-supply will be allowed.

qq) Defective items or items not as per given brands, make & model as quoted, if any supplied must be taken back and be replaced with no additional cost to tenderer.

5.13 ALTERNATE TECHNOLOGY IMPLEMENTATION

~~I. Where neither Underground Fiber nor ADSS cable laying is feasible due to technical or site constraints, keeping overall limitation mentioned in this RFP document for alternate technology, the PIA shall submit a detailed justification to the Independent Engineer (IE) and GFGNL. The IE shall review the submission, verify constraints, and provide a speaking recommendation to GFGNL. Based on IE's recommendation, GFGNL may approve the use of alternate technology, ensuring compliance with performance and SLA requirements. Implementation shall be at no additional cost to GFGNL.~~

I. Where neither Underground Fiber nor ADSS cable laying is feasible due to technical or site constraints, keeping overall limitation mentioned in this RFP document for alternate technology, the PIA shall submit a detailed justification to the Independent Engineer (IE) and GFGNL.

II. Further, for difficult terrain non accessible routes, ROW challenges, etc. alternate technologies for connecting GP to GP or GP to sub-block route, alternate technologies link (hop) quantity up to 4% of the total GP's scope may be permitted, subject to meet the

bandwidth delivery and SLA criteria commitment and with concurrence of GFGNL official.

III. In case the alternate technology is decided as Unlicensed Band Radio (UBR) or Free Space Optic(FSO), the PIA shall supply, install & commission the same as per the technical specifications mentioned in the RFP.

IV. There will be one EMS (Element Management System) for each Alternate Technology proposed in this RFP i.e. Unlicensed Band Radio (UBR) or Free Space Optics(FSO).EMS for each network elements of altenate technologies to be provided by OEM/PIA and same shall be integrate with the NMS at SNOC/SDC-Gandhinagar. Connectivity through API of EMS for integration with NMS or suitable mechanism will be provided by selected PIA/OEM.

V. The Service Portfolio, Service provisioning, Service Performance Monitoring, Service Audit and Security Compliance are ~~also~~ applicable for the solution implemented through alternate technology.

VI. Adequate spares, software updates and upgrades, L2/L3 support and Training as required to meet SLA shall be provided free of cost by the PIA for implementation of alternate technologies.

VII. The PIA shall be bound to facilitate/ coordinate for implementation through agency selected by GFGNL for other projects and support them for integration of the same with State NOC. The PIA shall also allow installation of EMS and/or any equipment in State NOC / any GFGNL PoP for integration with State NOC as well as Central NOC with approval from GFGNL. No space and Infra charges shall be payable to the PIA for the same.

VIII. In case of exigencies, if the PIA justifies connectivity of GPs on alternate technology beyond the above-mentioned limits, then with the recommendation of IE, PIA can submit such cases to GFGNL with proper validated documents. GFGNL in consultation with DBN reserves the right to approve the use of alternate technology for connecting GPs beyond the mentioned limits.

IX. The Project Implementation Agency (PIA) shall propose feasible alternate technology solutions, in consultation with the Independent Engineer (I.E.). The PIA shall submit a detailed report, duly endorsed by the I.E., to GFGNL through the designated area incharge/Head for onward submission to GFGNL Headquarters. Implementation of such solutions shall be subject to approval by GFGNL HQ.

X. For other cases like horizontal-last mile connectivity, Fttx with VAS, a separate tender already floated by GFGNL for implementation of alternate technology in such GPs. The PIA shall be bound to facilitate/ coordinate such implementation through agency selected by GFGNL and integration of the same with State NOC and selected PIA through this bidding process will be responsible and support to the other impanneled agencies for network service provisioning. The PIA shall also allow installation of EMS and/or any equipment in State NOC for integration with State NOC/ Central NOC. No space and Infra charges shall be payable to the PIA for the same.

XI. There will be one EMS (Element Management System) for each Alternate Technology proposed in this RFP and provided by the PIA.

XII. The deployment on Alternate Technologies shall be permitted for digital connectivity of revenue villages. The PIA shall work out the possible Alternate Technology solutions in consultation with I.E., and submit the report, duly recommended by the IE, to GFGNL. GFGNL

shall approve such cases for implementation. In case the alternate technology is decided as Unlicensed Band Radio (UBR), Free Space Optics (FSO)/ Light Fidelity (Li-Fi) or Aerial OFC laying (ADSS), the PIA shall supply, install & commission the same as per the technical specifications mentioned in this RFP relevant section and annexure.

XIII. Any damages including accidents because of poor quality of pole or poor workmenship will result into penal action as per the law of land including penalty of Rs. 2 Lakhs for such reported accidents/ incidences. This penalty will be over and above the cap limit. The penalty will not be applied if the incidence is triggered by the un-law person or intention attempt or force-majure.

XIV. For any kind of alternate technology implementation on field all types of infrastructure which includes but not limited to tower, pole, end to end cabling, connectors, accessories, etc. will be in the scope of PIA without any additional cost to GFGNL.

1. Tower Construction Requirements

a) The PIA shall construct self-supporting galvanized steel towers designed in accordance with IS 875 (Part 3): Wind Loads, and TIA-222 (Revision H or latest) standards for telecommunication tower design.

b) ~~Towers including the product(clamping) shall be engineered to sustain peak wind velocities of up to 180 km/h, including dynamic wind loads, gust factors, and terrain effects.~~

c) Pole & mast for UBR installation should withstand wind speed of minimum 150 Kmph in normal area and minimum 180 Kmph in coastal and Kutch area. Successful bidder has to ensure tower earthing, lightening arrestor, aviation lamps and other related components as per compliance requirement of DoT. The PIA shall be responsible for maintenance/replacement of poles forming part of the project infrastructure during the contract period without additional burden to GFGNL.Bidder has to ensure proper other terms and conditions mentioned in the RFP to mitigate from natural calamitites and same shall be applicable for the poles installed under this contract durations.

d) Structural safety margins must account for antenna loads, feeder cables, maintenance platforms, and future load expansions.

e) Proper grounding, lightning protection systems, and corrosion-resistant coatings must be incorporated to ensure long-term operational reliability and compliance with IEC 62305 standards.

f) Foundation design shall consider soil investigation reports, seismic zone classification, and uplift resistance parameters.

g) The mast to be used for UBR shall be made of ~~HT~~ Mild Steel angles of E350 grade ~~and~~ or MS angles of E250(A) grade confirming to IS:2062/Equivalent ASTM. All steel used shall be hot-dip galvanized conforming to IS:4759. The mast shall be designed for operational wind speed of 180Kmph. Design standard shall be as per is 800-2007. The mast to be installed with appropriate plinth and 3/6/9/12/15 Mtr height above ground level to ensure sustained LOS.

Sr. No.	Parameters	Minimum Specifications
1.	Material of construction	Mild steel
2.	Other	Should be hot dip galvanized
3.	Wind survivability	Should withstand wind speed of minimum 180 Kmph
4.		Foundation should be constructed to support above mentioned wind speed
5.		Foundation bolt, foundation plate, other accessories must be supplied to support above mentioned wind speed
6	For Wall Mount	With proper safety precautions (3mtr) minimum 2 C- Clamp support

Safety and Quality delivery will be the top priority,

a) Team must follow all standard industrial safety practices, including but not limited to wear proper safety gear,safety belt on tower, Fence the work area.
b) Ensure safe material movement on the terrace or allocated space at GP and customer site using appropriate safety arrangements.
c) Not to damage any private/public property.
d) Drilling and digging must be execute after official permission.
e) Bidder must use safety belts, ropes, helmet and wear full safety kits during tower erection as well as radio/antenna installation during climbing on tower/mast/RTT.
f) Tower must be color-coated with white and deep orange as per guidelines. The tower shall be colored with alternate bands of orange & white or red & white paint as per ICAO recommendations. The Ready mixed paint, primer, Enamel etc. used for tower painting, may be as per the IS Codes (IS 2074, 2932, 2933) The tower painting shall be done after tower erection.
g) Install a lightning arrester at the top and directly connected to a separate earthing pit located near the tower.
h) As per Planning P2P (Point to Point) for single link or P2MP(Point to MultiPoint) link can be integrated for end customer delivery. In both the cases, hub/ source must be existing GP(Gram Panchayat), no repeater wireless(dependency from existing customer) can be planned.

2. Optical Wireless Communication (OWC) – LiFi/FSO Systems

- Towers for LiFi/Free Space Optics (FSO) shall be constructed to ensure precise optical beam alignment, minimizing divergence and dispersion across communication endpoints.
- A four-legged lattice tower including the product(clamping) design is mandatory to provide enhanced torsional rigidity, reduce oscillations, and eliminate micro-vibrations that affect optical signal coherence.
- The design must meet EN 1993 (Eurocode 3) structural standards or equivalent Indian design codes, with additional damping mechanisms if required to maintain optomechanical stability.

- Towers must be equipped with anti-reflective platforms, vibration dampers, and mounting provisions for active beam alignment systems where applicable.
- Environmental durability must be validated for high-altitude, coastal, or humid regions, with towers certified to withstand temperature variations, UV exposure, and 180 km/h wind speeds as per ASTM E330 or equivalent.
- Provisions for power backup systems (UPS, solar integration) and secure equipment enclosures for OWC transceivers shall also be included.

5.14 ELECTRONICS INSTALLATION

a) The PIA shall supply and install network solution or electronics infrastructure for the successful creation/ upgradation of a robust, redundant and carrier-grade network to support and enable retail, enterprise, and wholesale services.

b) It shall also be responsible for supply of new electronics infrastructure and its accessories to perform end to end implementation of the same across the network.

c) Adequate power back-up infrastructure shall be provided by the PIA to ensure network availability as per defined KPIs.

d) Further, the PIA shall perform end-to-end testing of the electronics infrastructure in accordance with good industry practice, specifications and standards, and acceptance testing template for quality assurance.

e) PIA shall be responsible for integration of existing Phase-1 OLTs at Block Headquarter with sub-Block router or any nearby available node created/to be created and ONTs at GPs shall be utilized for providing connections from the OLTs.

f) PIA shall prepare and maintain asset records listing the assets at site locations required for the performing the O&M and the same shall be shared with GFGNL every quarter.

g) KPIs shall be monitored and reported by the PIA to GFGNL on daily/ weekly/ fortnightly/ monthly /quarterly basis, as required.

h) In case of any defect, deficiency or deterioration in the project, poses a hazard to safety or risk of damage to property, the PIA shall promptly take all reasonable measures for eliminating or minimizing such danger.

i) FAT would include installations and commissioning of IT equipment and non-IT equipment at SDC/SNOC, Sub-Block and Gram Panchayat, commissioning of all network links and necessary site refurbishments (Earthing, electrical connectivity, structure cabling etc. as applicable) as well as testing of traffic from the Router at Gram Panchayat to Sub-Block , Sub-Block/Master Block to SDC/SNOC and further to State NOC and Central NOC.

j) General site readiness like provisioning of proper earthing, racks installations, rack grouting etc. shall be carried out by the PIA at no extra cost to State/SIA.

k) **Provisioning Mini OLTs:** PIA shall require to be installed Mini OLT at each GP for existing and upcoming connectivity from GP. The PIA is required to make provision for housing the same in the rack (cabinet) being provided by it as per technical specifications. Normally, the size of the

Mini OLT should be 1 RU. The PIA shall allow the power to the mini OLT to be tapped from the Power System being available at the GP location. The PIA will also facilitate testing to the BNUs, whenever required, to ensure desired connectivity/ uptime to all the FTTH customers of the housed OLT. The PIA shall supply, configure, and integrate the Mini OLTs with the MPLS network for last mile connectivity. Selected bidder has to ensure the proposed mini-OLT should support atleast three (3) / Four (4) compatible ONT's OEM for future network provisioning and avoid governance challenges, preferably mentioned on the bbnl website , " https://bbnl.nic.in/index1.aspx?lsid=735&lev=2&lid=588&langid=1 " or any other central government website. Proposed equipment/solution/ mini OLT shall interoperable with all existing ONTs being used in BharatNet Phase- I and GFGNL BharatNet Phase -II and any future TSEC -GR Certified GPON ONTs and OLTs.

l) **Modification in the Ring Architecture to meet increased Bandwidth Requirement**: Initially each GP dual homed ring is be designed for upto 10Gbps with around 6-7 nodes. However, if there is a requirement subsequently to increase the capacity due to increased bandwidth requirement, additional ring shall be created splitting the nodes using spare fibres and spare ports at the Sub-Block router. If required, additional Sub-Block router may need to be installed at the Sub-Block for which separate payment shall be made as per the finalized itemized rates.

m) GFGNL reservers the rights to handover existing horizontal customer connectivity to selected PIA on existing O&M charges paid to existing agency based on mutual agreement with GFGNL and selected PIA. The SLA and other terms and conditions will be applicable as mentioned in the existing tender and shared to bidder.

n) PIA shall support for provision the bandwidth for the services as per the requirements of the end customer. The PIA shall also build up the dark fibre on end-to-end basis for provisioning the same for commercial use without any additional burden to GFGNL.

5.15 SCOPE OF WORK FOR STATE- NETWORK OPERATIONS CENTRE (S-NOC) IMPLEMENTATION

1. GFGNL has already established S-NOC with state of art facilities at Udyogbhavan, Gandhinagar as part of the BharatNet Phase-II. The PIA will be required to upgrade these S-NOCs in accordance with the functional requirements mentioned below, by suitably modifying the indicative BoM (RFP Clause_9.44) after obtaining the approval from GFGNL/IE.The Active, IT and Non IT component list given in (clause 9.36) Annexure-XXXVI. This infrastructure can be utilized/upgrade/replaced to meet the requirements of ABP.GFGNL shall provide the space and power at SDC/SNOC.Note: The existing IT and Non-IT infrastructure listed in Annexure-XXXVI is not included as a separate payable item under the Financial Bid. The Bidder shall, at its own cost and without any additional financial implication to GFGNL, upgrade, augment, modify, repair, replace, or supplement the existing infrastructure, wherever required, to meet the functional, technical, capacity, availability, security, and SLA requirements of the Amended BharatNet Program. No claim for any additional payment under this account shall be considered of extra line items by GFGNL during the entire contract period.

2. BharatNet State Network Operation Centre (S-NOC) shall be required to monitor the up time, qualitative parameters of the BharatNet network and provisioning of the services as mentioned in the RFP. The fundamental purpose of this RFP is to provide technology led governance of the entire network including automation in service provisioning, scanning of the network health, digital routes for identifying fiber location, digital measurement book, digital SLA and top management level dashboard. The IT infrastructure at S-NOC shall be in full redundancy architecture and will be provisioned with the required storage, computing, networking, security, backup, monitoring, management and help desk components.
3. PIA shall be responsible for establishing of an S-NOC for managing the existing (Phase-I & II, to be upgraded) and new network (to be created) in Gujarat State. The PIA shall be responsible for the deployment of all requisite hardware, software, and manpower for monitoring, helpdesk, troubleshooting, etc.
4. The scope shall also include design, supply, installation, testing, commissioning, documentation, operations and maintenance of NOC along with workforce deployment, training, etc.
5. The NOC shall be capable to perform key functions but not limited to i.e. fault management, performance management, configuration management and security management etc.
6. PIA shall submit details such as APIs', protocols, version, attributes etc. to GFGNL. Once, the information has been shared at detailed level, both PIA and GFGNL shall complete integration of NOC within 90 days from agreement signed date.
7. Further, the PIA shall perform end-to-end testing of the NOC in accordance with good industry practice, specifications and standards, and acceptance testing template for quality assurance.
8. The S-NOC shall enable all the eMS to be integrated with Central NOC to fetch the required parameters directly.
9. The PIA shall give rights and access of State NOC to Central NOC or any other person/ agency authorized by Central NOC for provisioning of OLT or any other equipment/ services of ABP network. **Note:** i) The access from Central NOC (CNOC) to State NOC (SNOC) or viz a viz, is expected to be provided in a secure and controlled manner, which may include: Web-based UI access (through role-based login credentials), and/or API-based integration, wherever supported for automated provisioning and monitoring.However, The exact method of access (UI/API) shall be finalized during the detailed design and implementation phase, ensuring compliance with security policies, interoperability, and operational requirements. Bidders are requested to design the solution accordingly and ensure flexibility to support both modes of access to avoid last moment rush and delay in project.Further,SDC/State NOC to Central NOC DCN link shall be arrange by GFGNL for which PIA shall not be charged. Ii) Successful Bidder shall take the handover of the existing system as is where is basis as per NOC delivery timeline, it is bidder's responsibility to migrate the existing system through respective EMS to new single platform for better monitoring of existing and new network assets.

ii) It is not mandatory to use the existing resources. However, PIA through OEM ensures Reuse wherever feasible; replace where technically justified and necessary to meet RFP requirements.

10. All the deliverables for the S-NOC items, mentioned in the tender, shall be as per the relevant TEC GR/ Standard, if not defined otherwise in the RFP/ Amendments. The items which are not mentioned in the tender shall be optional.
11. The S-NOC will cater the requirement of monitoring of implementation, O&M activities &

utilization of BharatNet Network, which will have extended up to villages in Amended BharatNet program.

12. PIA shall be responsible for design, Supply, Installation, commissioning, validation, implementation and post implementation including existing infrastructure's operation and maintenance of S-NOC for 10 years.
13. PIA shall also be responsible for complete IP scheme design and allocation as per requirement, third party integration, monitoring of all components, configuration of all devices, monitoring all devices through NMS/EMS, Helpdesk/Service desk solution. Coordination with multiple agencies for project execution, Compute and storage solution, follow guidelines- GOI, TRAI, GOG, DST, supplied device with all required licenses, features as per requirement etc. PIA is free to add the component/device/server/services to meet the operational requirement.

Note: PIA shall be responsible for complete IP schema design, planning, allocation, management, and monitoring as part of the overall solution. The bidder may propose an IP Address Management (IPAM) module/system, if required for better O&M , to meet the functional and operational requirements of the project.

However, provision of a separate IPAM solution is not mandatory. PIA for best industrial practices of O&M shall design the solution. The PIA shall ensure compliance with all requirements related to IP management, irrespective of the solution proposed. No separate payment will be given to PIA.

14. The S-NOC shall house the OSS solution to monitor the complete IP network (all the active devices, any other SNMP enabled devices in the network, IT systems in the S- NOC) and optical network.
15. PIA is also responsible to provide necessary guidance, documents, training and technical work-flow information to other agency for integration.
16. PIA shall be responsible to provide separate logins (NMS/EMS, OSS+BSS+CRM, Helpdesk etc.) for multiple agencies and shall be responsible for maintain audit trail.
17. Successful PIA is responsible to coordinate with GFGNL team for integration with GFGNL devices, traffic management from Central & Cluster/Zone/District/Sub-Block to GP level through GFGNL media (DWDM, RFMS, Router, OLT, ONT, Switch, CPE, etc.), resolve all the technical issues.
18. PIA shall be responsible for integration of S-NOC with BBNL/DBN,DoT or any other authorized ask from GFGNL for government agencies through API or any other possible mechanism.
19. The S-NOC shall provide a unified platform to facilitate the effective utilization of BharatNet. It will support operational and commercial activities through key modules, including but not limited to:
    a. Trouble Ticketing
    b. Customer Relationship Management (CRM)
    c. Fiber Management for monitoring fiber cuts and faults
    d. Public Grievance Management
    e. Reporting Functions
    f. SLA Monitoring and Management for ILL, network, and connection services
    g. Subsidy Management and BNU Grievance
    h. Project Monitoring Tools

i. Asset Management and Monetization Tools
j. Performance Monitoring for field staff and fault teams

Note: The existing and newly integration of the BharatNet network required variety/multiple OEM integration with SNOC. The key objective is to have Unified network operational experience,Single integrated dashboard/reporting environment, End-to-end workflow automation,Common ticketing and asset lifecycle management, SLA monitoring, workforce performance tracking,etc. For these full accountability will be with the PIA.

20. PIA shall ensure that the logs are backed up and truncated at regular intervals.
21. Logs and other items like trouble ticket details related to invoicing and payment shall be retained for 1 year or date of invoice settlement or based on GFGNL requirements whichever is later.
22. S-NOC shall be manned with qualified manpower for S-NOC operations. S-NOC shall be managed 24x7x365 and accordingly manpower to be planned. S-NOC shall always be able to generate inventory report of active elements like port status, port utilization status etc. for future perspective through Network Management System (NMS). S-NOC would also maintain necessary reports like details of no. of nodes per logical links on any particular fibre route through NMS.
23. PIA shall host EMS of all the active equipments to the proposed HCI solution. Application of GIS and NMS are to be hosted at SDC infrastructure.
24. PIA shall be solely responsible for supply, Installation and commissioning of leaf switches at SDC and their O&M for entire contract duration.
25. NOC shall support language like English~~, Hindi and Gujarati~~ for URL and IP database and Dashboard for compliance related requirement. Further based on tenderer requirement in future it should have the facility to support on regional language (“Gujarati”) and National language(“Hindi”) without any additional cost to GFGNL.
26. All the EMS like routers & RFMS of the existing network as well as to be deployed under ABP or any other alternate technology EMS shall be integrated to S-NOC NMS.
27. The PIA shall provide a centralized S-NOC Data Lake to ingest structured and unstructured data from NMS, OSS, BSS, CRM, Helpdesk and Inventory systems.
28. The Data Lake shall support analytics for network status trends, utilization trends, SLA performance, risk visualization and performance optimization insights.
29. AI/ML capabilities, if proposed, shall be limited to analytics and visualization and shall not involve autonomous decision-making.
30. The S-NOC shall provide real-time operational status of OLTs/ONTs (GPs), routers, switches, ~~Wi-Fi access points~~, all other active elements of the network, FTTH(Horizontal and LMCA) connections, and more. This information will be accessible via web and app interfaces and integrated with the Digital Bharat Nidhi (DBN) Project Monitoring tool.
31. The S-NOC shall generate comprehensive reports which can be customized based on day, week, month, quarter, year and as per the requirement suggested by the GFGNL/ DBN and stakeholders. The following reports are minimum requirement including but not limited to:
    a) GP uptime/downtime, including progress reports
    b) Fiber optic cable cuts and performance
    c) SLA, KPI and performance parameters mentioned in the RFP.
    d) Node (mini-OLT, router) status

e) Data consumption at GPs and nodes
f) FTTH connection status and usage reports
g) Live FTTH connection status dashboards
h) The S-NOC shall generate zone-wise, district-wise, Sub-block-wise, and GP-wise reports but not limited to detailing:
    I. Media type, commissioning dates, and work status
    II. Implementation phases, Wi-Fi/access point activity
    III. FTTH connections (provided/active)
    IV. Dark fiber leasing, bandwidth leasing, and data consumption

32. The S-NOC shall enable API-based integration or any other proven way to integrate and share data with C-NOC. Further S-NOC shall have capability to integrate the other project stakeholders on boarded through GFGNL/DST for their billing systems and SLA performance .
33. The S-NOC shall maintain comprehensive records of the OFC transport network, including:
    d. Equipment details, fiber inventory, and connectivity
    e. Bandwidth allocations for service providers
    f. Traffic types at nodes
    g. Faults and rectification logs, service provider-wise
34. State S-NOCs will be interconnected with the Central NOC via APIs. The health of state S-NOCs will be monitored centrally.
35. The DCN links for connectivity of Master-Block routers to State NOC and State NOC to Central NOC shall be arranged by GFGNL for which PIA shall not be charged.
36. State/UT-specific dashboards shall provide quality, quantity, and other details for local administration. Centralized billing/monitoring dashboards shall also be made available to union ministries and departments funding BharatNet services. API integration with dashboards/applications such as but not limited to GRIT, CM dashboard, and DoT will be facilitated.
37. The S-NOC shall include systems for managing complaints and grievances, including:
    I. Subscriber Complaints: Web portals and call centers for issues related to service quality, billing, etc.
    II. General Complaints: Systems for grievances from BNU, vendors, sub-vendors, and stakeholders, including queries and suggestions.
    III. PIA shall create a helpdesk email ID under GFGNL domain to cater the complaint, grievances over email. OEM along with the PIA has to ensure design and technical compliance of the proposed solution and has to ensure all service support during entire contract period.
38. PIA shall provide SMS Gateway and Email Gateway to meet the operational requirement.
39. The PIA shall be required to carry out integrations, as needed, with other systems of GFGNL (including but not limited to GIS, NMS with OSS/BSS, EMS, ERP, etc.) for the purpose of exchanging alarms, inventory, configurations, service life cycle data, performance metrics, GP lit-up status, project progress, or any other relevant information during the contract period, at no additional cost to GFGNL. The PIA shall also be solely responsible for implementing all change requests as and when required during the contract tenure, without any additional cost to GFGNL. Any deliverable related to ABP project will not be consider as "CR".

40. PIA shall take the HOTO of existing IT infra like Video wall, computer terminals, UPS, RACK (as listed in annexure) for comprehensive annual maintenance contract (CAMC). It is to be mentioned that the items listed here are in working condition and are running with proper functionality. PIA shall also take the handover of ICT infra mentioned in annexure To avoid vendor lock-in with existing OEM, the PIA is allowed to purchase CAMC from OEM back to back or non back to back from the reputed CAMC provider.
41. PIA shall be responsible for establishes a framework to meet the compliance in accordance with applicable data protection laws in India, including but not limited to the Information Technology Act, 2000, and the Digital Personal Data Protection Act, 2023 (as amended from time to time).
42. The PIA must deploy all software application at the State Data Centre, Gandhinagar, and may be required to deploy at any other location as specified by GFGNL in the future. GFGNL shall arrange the necessary permissions for hosting. PIA shall provide the optimal sizing. PIA shall submit sizing in following format.

Service	Core	V CPU	RAM (GB)	Data Storage (GB)	Backup storage(GB)	OS Storage (GB)	Total Storage (TB)
NMS including OSS, BSS, ITSM, Helpdesk and Grievance, CRM,							
GIS							
GIS (Videography and photography for Virtual inspection)							

Remarks: Compute Storage of GIS Videography and photography for Virtual inspection are to be arranged by PIA.

43. Sizing of existing EMS, GIS, NMS is given in clause 9.37 (annexure-XXXVII).The primary Internet source will be the National Knowledge Network (NKN).The PIA is responsible for developing and implementing a solution that manages internet and intranet traffic from ABP PH-III.
44. Additionally, this core network infrastructure and the associated software will support virtualized access technologies, inspections, and tools to validate and automate processes for verifying digital milestones as mentioned in RFP. This includes defining processes and workflows,

addressing stakeholder gaps, and offering automated systems for payment and validation. The PIA is encouraged to propose and outline the tools or technologies that can fully automate the processes and systems to meet all requirements without manual intervention. Along with this project Last mile connections of different gov. institutes are also to be considered for visualization, configuration, fault management and payment milestone as per SLA.

45. The PIA must propose a comprehensive solution as per the ABP PH-III, considering uptime and SLA management processes. This includes identifying, analyzing, and integrating alarms related to faults, performance, configuration, and service etc. After integration, the PIA must provide valid Root Cause Analysis (RCA) for each fault in the incident and trouble tickets.
46. **Automated SLA & Performance Reporting:** The PIA must ensure that no manual intervention is required to calculate the SLA module. The SLA system should provide detailed reports on equipment uptime, including RCA, for daily, weekly, monthly, quarterly, or any custom date ranges. The system should generate detailed reports categorized by issue type, technology led, zone, district, and block, GPs, IP/MAC etc. and not limited to this may require to develop as per future requirement raise by GFGNL. PIA has to develop solution and require to prepare Meta data by creating unique code/id/using LGD code etc. of the scope of all gram panchayat locations, other all government offices locations of BharatNet project and based on this location with analytics. PIA has to design and implement monitoring dashboard and all the reports. If any element is deleted in EMS that should be reported as down in the monitoring tool/dashboard and respective incident or ticket also need to generate automated for such incident.
47. **OSS-BSS & NMS Integration for Service Management:** The PIA is required to deploy and plan an integrated OSS-BSS (Operational Support System - Business Support System) and NMS (Network Management System), ensuring that all customer order covering all types of customers and services are properly managed and integrated with the proposed OSS-BSS system. This integration must support the full lifecycle of services, from provisioning to monitoring, management, and eventual termination. The OSS-BSS solution should enable the effective handling of all service-related activities, ensuring seamless coordination across all service stages. Additionally, the PIA is encouraged to propose any cost-effective solutions that could enhance the functionality or value of the system, beyond the core requirements specified in this RFP. Furthermore, software modules, and related solutions must strictly comply with the latest technical specifications defined by the TEC GR (Telecommunication Engineering Center - Generic Requirements) TEC 48100:2025 with latest amendments, if anyfor the respective line items, modules, or electronic components, ensuring alignment with industry standards and regulatory guidelines.
48. **ABP PH-III Integration & NOC Coordination:** PIA shall create FCAPS (Fault, Configuration, Accounting, Performance, Security Management) templates defined in SOP by IE or designated agency by GFGNL. The PIA will integrate with UNMS Delhi and Bangalore NOCs or any other location, providing data via APIs. The PIA is responsible for Bangalore and Delhi UNMS NOC or any other location integration, including backup lines, and coordinating with stakeholders. Regarding UNMS integration and monitoring, the PIA will establish connectivity and integrate with the UNMS Delhi and Bangalore NOCs, providing GIS, inventory, FCAPS, and service provisioning details via APIs.
49. **Migration & Expansion of Core Infrastructure:** PIA has to create and migrate over core

infrastructure to facilitate all working services including all inventories for all the gram panchayats, horizontal offices, GISL Wi-Fi services, and other P2P services which are already running in the Phase 2. Tentative count of all the services of Phase 2 is 30000+ (Including existing CRM module of ERP, details will be provided during migration) and phase 1 will be the scope of PIA without any additional cost to the GFGNL. This is very important expectation and GFGNL is seeking the expert PIA to co-operate and operate the migration swiftly. The GFGNL NOC team will also provide full support to the successful PIA for business continuity even upon change of guards.

50. PIA shall provide all the kind of training and module wise SOP to all the employees of GFGNL, all the team members of respective stakeholders during the project and once in every year of O&M phase.
51. **Third-Party Audits & Quality Assurance:** Regarding FAT, Audits, and Quality Checks, GFGNL may nominate Third Party agencies for FAT, milestone payments, invoice validation, audits, or quality checks, and the PIA must provide necessary documents. Concerning Support, GFGNL will provide administrative support.
52. **Geographical Information System (GIS):**

a. Gujarat Fibre Grid Network Limited (GFGNL) intends PIA to procure services of a competent firms for establishing a GIS system to help in management, analysis, and display of its fibre network to be created (accurately to 20 cm geographical precision) as part of BharatNet Phase III implementation with 10 years of operations & Management. PIA shall arrange the storage on cloud with Cert-in and MeITY approved for videography and photography of survey and implementation project data. GFGNL shall provide compute and storage for rest of the application related requirement. Cloud Service Provider shall be MeitY-empanelled and host all project data within India

b. Intended use of envisioned GIS is for Optical Backhaul and Access Network layout planning, capturing of field data, tracking OFC route, auto computing project progress by displaying Video/Photos to virtual inspection team, viewing MIS reports from NMS and viewing web dashboard as per detailed specification

c. GIS software and manpower provided to operate the same shall be compatible with the GIS mapping procedure.

d. Survey team will provide the information/data and feed the same into GIS. Implementation team will provide the information as the work get completed on everyday basis.

e. As built is to be completed which makes the confirmation work for data submitted by the team.

f. The equipment which shall be integrated into S-NOC by completion of commissioning, gets discovered in GIS also. So, Further, completion on all above deliverables payment milestones of project completion to be mapped which trigger the payment procedure on keeping delay penalty into account.

g. Submeter accuracy(20cm) to be achieved with DGPS.

h. GIS to be integrated with NMS so on single window/umbrella multiple information can be visible.

i. Videography and visualization on web portal/mobile application is to be done as per the ask

in BharatNet phase III RFP and also mentioned in technical specification.

j. API integration with different applications like RFMS, OSS, BSS and ERP is to be done as per technical specification.

k. User management as per the role to be done describe in technical specification.

l. The solution must bundle GIS layers for block boundaries, GP, and village locations. Additional necessary layers for network planning should also be provided- describe in technical specification.

m. Administrators should be able to attach forms or checklists, setting mandatory fields as part of the workflow or network process- describe in technical specification.

n. GIS software shall support desktop planning with fibre network design topology, including ring-based and linear-based structures with shortest route determination. Also able to place infra elements like pole, manholes, duct. Further requirements are described in fibre inventory management and network modelling of technical specification.

o. GIS software shall be able to use template-based modelling for configurable design specifications.

p. GIS software shall be able to calculate the power and loss as per the user configurable and fetching real time NMS/EMS data.

q. GIS Software shall be able to provide feasibility of dark fibre, fibre distance between any two points as per the ask of administrator and also be able to integrate with any proposed or existing GFGNL tools for penalty calculation of Dark fibre.

r. GIS Software shall be able to provide real time monitoring of passive and active equipment and also be able to assist in cut scenario, network equipment failure scenario.

s. GIS Software and its mobile app shall be able to provide on line and offline functionality of data capturing to creating entities and notifications.

t. GIS to be provided reports as per the need by bidder/PIA/TPA/IE/GFGNL.

u. During project phase, PIA shall provide required OEM trained qualified manpower for GIS operators who are responsible for planning, configuration, authenticating and MIS work for reports generated from GIS.

v. GIS Software shall be able to provide FRT and patrolling management which includes life cycle management of TT and WO. Also be able to suggest the movement and optimal work assignment to team and leave management, attendance management. Further requirements are described in Field operation management.

w. GIS Software and its mobile app shall be able to provide measurement book functionality as per ask in amendment BharatNet project for validation of work, project timelines, task dependencies and milestones. Further, Penalty calculation based on the as built data which comprise of soil strata, trench depth as mentioned in scope achieved trench depth and non-use of trench depth protection between markers are to be calculated, reports to be generated in excel and PDF as per custom requirement.

x. Identification of route through GIS OFC link ID with chainage marking are also to be done.

y. GIS Software and its mobile app ~~supplier~~ shall provide training to all concerned ~~stack holder~~

stakeholders who are using the functionality directly or indirectly.

z. PIA shall customize the supplied tool as per additional requirements by GFGNL.

aa. Any software upgrade, functionality or change request for operation continuity with respect to defined scope has to deliver by PIA without any additional cost to GFGNL.The PIA is required to develop the application and all associated forms in accordance with Videography Section of the ABP and its subsequent phases. The scope of the PIA includes ensuring that all video applications forms/function with length and timestamp as intended for various objective. Additionally, the PIA must support all necessary requirements for creating a digitized video/photo geotagging tool, forms in web and mobile as and when required or executed by GFGNL

bb. The subscription for base map services (with satellite imagery and vector view) proposed as part of solution should be in the name of Gujarat Fibre Grid Network Limited (GFGNL) covering the complete contract period without any additional cost to GFGNL.

cc. **Software / NMS / GIS Enhancements, Upgrades & Change Requests:**

The PIA shall be responsible for the design, development, implementation, and maintenance of an end-to-end Change Request (CR) Management Workflow through a dedicated dashboard for Software, NMS, and GIS. The workflow shall facilitate request initiation, tracking, review, approval, implementation, and closure, with appropriate role-based access and approval hierarchy involving all relevant stakeholders. The scope shall include capturing change details, stakeholder comments, approvals at various stages, implementation status tracking, action item monitoring, audit trails, notifications,impact and reporting mechanisms to ensure complete visibility and governance throughout the change management lifecycle.

i. Routine Upgrades and Minor Enhancements

The Bidder shall provide all patches, bug fixes, security updates, minor and major version upgrades,reports,forms, performance improvements, and minor enhancements during the Contract Period at no additional cost to GFGNL. Such activities shall not be treated as Change Requests (CRs).

ii. Change Requests (CRs) for Softwares NMS/GIS etc.

a) Any major requirement beyond the scope of work mentioned in the RFP, shall be treated as Change Request.

b) Change request management shall be conducted based on request received from the GFGNL.

c) subject to the approval of the Change Request proposal. The activities that shall be treated as changes request are mentioned below:

- Functional changes in the application
- Development of new modules/Form/Report in the developed system
- Changes in the workflow or core application framework

- Addition of new modules, custom functionality,
- major architectural modifications, etc.

iii. Pricing for CRs

a) The efforts weighted will be treated separately.

b) The Bidder shall submit a fixed resource rate card/manpower effort matrix as part of the commercial proposal, which shall be used for pricing all approved CRs during the contract period.

iv.Testing and Deployment

All upgrades, enhancements, and CRs shall be tested in a UAT/Staging environment prior to production deployment. Any activity requiring downtime shall be carried out during mutually agreed maintenance windows. The Bidder shall provide a documented rollback plan for all major changes.

v. SLA Requirements

SLA will be treated as RFP clause- 7.10.2.13.

vi. Documentation and Training

The Bidder shall provide updated technical and user documentation for all major enhancements and approved CRs. Where required, the Bidder shall conduct training for designated officer's of GFGNL prior to production rollout.

vii. Compatibility and Vendor Lock-in

The Bidder shall ensure that all updates and upgrades remain compatible with the existing ecosystem (Hardware and softwares) and shall not result in any vendor lock-in or forced dependency on specific software versions.

The GIS scope of work is not limited backhaul or access network but whole network which is being laid or maintain by PIA.

53. PM (Project Monitoring) tool

The project monitoring tool shall enable real-time tracking of project progress, (timelines and milestones) including the status of network infrastructure deployment, equipment installation, and connectivity establishment of Amended BharatNet program.

- PIA shall provide the input for managing project documents, drawings, specifications, permits, contracts, and other relevant documentation etc.
- PIA shall provide all required information for the application dashboard in standard/ defined format such as measurement book, acceptance test proofs etc. The details shall be, but not restricted to, as under: -
    - Block/GP wise Cable Length.(i.e., Where Block will be read as Sub-Block as well as master block)
    - Block /GP wise Duct length. (i.e., Where Block will be read as Sub-Block as well as master block)
    - Block /GP wise Trench Length.(i.e.,Where Block will be read as Sub-Block as well as master block)

- Total as build OSP network elements count/details of FDMS/ Handhole/ Manhole/ Site/ Splice Closure etc.
- Total Planned OSP network elements count/details of FDMS/ Handhole/ Manhole/ Router/ Site/Splice Closure etc.
- Total ISP network Elements count/details of Router/ Switch/OLT /Repeater /Equipment's etc. including existing inventories and newly developed infrastructure.

- PIA shall be responsible to update the project progress in the project monitoring tool, enabling the system to automatically create milestone-based proforma invoices.

54. ~~Operational Visibility Platform~~ (NMS + OSS + BSS):

I. The software solution shall be required to provide a scalable, automated, and vendor-neutral solution for network deployment, monitoring, and service management across multi-vendor IP and optical infrastructures.

II. The system will streamline operations, ensure SLA compliance, and support end-to-end lifecycle automation with mobile-based deployment, GIS-based topology visualization, and OEM-engineer backed customization. **Note:** Normally, GIS shall provide the physical topology including fibre core trace and NMS shall provide the Logical. However, based on customized requirement based on field, SoP shall be prepared and shared for delivery and system should support without any additional cost to GFGNL.

III. The PIA shall design, supply, configure, integrate, deploy, operate and maintain an **Integrated software platform** for monitoring, operation, governance and utilization of the BharatNet network in the State, in accordance with the requirements of the **Digital Bharat Nidhi (DBN) Amended BharatNet Program**. The S-NOC solution shall comprise a tightly integrated suite of **Network Management System (NMS), Operations Support System (OSS), Business Support System (BSS), Customer Relationship Management (CRM), and Helpdesk & Grievance Management modules**, operating as a unified platform.

IV. The solution shall provide centralized, real-time visibility of BharatNet infrastructure and services from State level down to District, Block, Gram Panchayat and Village level; enable proactive fault detection, trouble ticketing, SLA monitoring, MTTR tracking and escalation; support utilization, monetization and regulatory reporting for dark fiber, bandwidth leasing and FTTH connections; provide a single-window interface for Service Providers, stakeholders and Government users; and establish a transparent, SLA-linked grievance redressal mechanism with complete audit trails.

Note: For monetization reporting of dark-fibre following, but not limited to, information shall be captured by the PIA , like,

- Dark fiber leasing inventory, occupancy and utilization reports.
- Bandwidth leasing/customer-wise service utilization reports.
- FTTH connection statistics, subscriber provisioning and service status reports.

Reports required for operational, management, audit, regulatory and Government review purposes.

Further, For For SLA Linked grievance redressal- GFGNL is seeking following functionality but not limited to : The S-NOC solution shall provide a centralized complaint/ticket management capability for registration, assignment, tracking, escalation and closure of grievances/complaints related to BharatNet services and infrastructure.

V. The integrated S-NOC platform shall support role-based access, secure data exchange, open standards-based integration with network equipment, GIS systems and the Central NOC (C-NOC), and shall generate operational, SLA, utilization and grievance reports as required by DBN, DoT and State authorities.

VI. The PIA shall ensure seamless interoperability between all modules, near real-time data synchronization, compliance with applicable security and data protection regulations, and 24×7 operational readiness for the duration of the contract.

VII. The PIA shall take handover of existing compute and storage which consists of EMS of existing phase II network components in co-ordination with GFGNL.

VIII. For Handover of phase-I EMS, coordination with BSNL/BBNL shall be done by PIA and arrangement of the migration and storage are also to be done by PIA.

IX. PH-III tentative component count are as below along with periodicity and retention time.

PH-III Component count

Device Type	Count
GP router	15000
Mini OLT	15000
Block router	1000
RFMS	1000
ONT/switch	70000
UPS	15000
Total	~~102000~~ 117000

Tentetive periodicity and retention time(may change at the time of execution as per the need of project and operation)

DC production sizing for T&D/pre production to be considered as per industry standard

fping-5min (Direct NE)

Polling- 15 mins

Raw event back up - 3days

Raw data- 60 days

Consolidated daily data- 180 Days~~/ 90days~~

Consolidated Monthly data- ~~5 years/ 1~~ 3 years

55. MIS Report:

solution should be able to generate the following reports but not limited to

Sr. No	Report Type / Category	Specifications	Periodicity
1	Dashboard Reports	Shows N/W availability, Average BW available vs Usage per GP, Latency, Jitter. Custom dashboards for Managing Director, Senior Management & Field Offices in a readable format.	Daily
2	Bandwidth Availability & Utilization	Available bandwidth per of Router, ONT, OLT, Mini OLT and switch devices Taluka/Block-wise, District-wise, and State-wise. Bandwidth Utilization (Max, Min, Avg) per GP Ring, Block Ring, and District Ring.	Daily
3	Device Availability & Performance	Availability of Router, ONT, OLT, Mini OLT and switch devices (Live vs Faulty) PoP-wise, Block-wise, District-wise, and State-wise. CPU, Memory, and BW utilization of Routers & Switches.	Daily
4	Fault & Incident Management	Total No. of Complaints Raised. Trouble Ticketing & Life Cycle Management for Network & Service Problems. Ageing Report of Issues/Complaints/Incidents.	Daily & Monthly
5	Network Performance & Monitoring	Network KPIs (Up/Down Status), SLA Monitoring, Real-time Traffic Monitoring, Threshold Alerts, and Zoom-in Analysis down to the port and IP level. Historical reports for various periods.	Daily & Weekly
6	Receive Signal Strength Monitoring	ONT/Router/Mini OLT signal strength tracking with alert triggers when below the defined threshold.	Daily
7	Configuration Management	Auto discovery of devices, Resource Inventory Management, Service Template Management, and Configuration Change Reports.	Quarterly
8	Preventive & Scheduled Maintenance	Preventive maintenance reports, Scheduled maintenance tracking, and Software upgrade/enhancement reports.	Quarterly & Monthly

Sr. No	Report Type / Category	Specifications	Periodicity
9	Security & Access Management	Role-Based Access Control (RBAC), Operator Authentication, Audit Logs, Helpdesk Module with SMS/Email Notification.	As Required
10	Network Topology & Mapping	End-to-end network topology connectivity till the last mile CPE, dynamic discovery of fibre connectivity.	As Required
11	Inventory & Asset Management	Inventory Reports including Dark Fibre Availability, Number of Fibre Used, and Penalty Calculation. End-to-end Asset Lifecycle Tracking including hardware, software, and license management.	Quarterly
12	Reporting & Data Extraction	Reports with drill-down features (package-wise, district-wise, block-wise, ONT/Router/Mini OLT and switch -wise). Tabular and Graphical reports with extraction in Excel, CSV and PDF format.	D/W/M/ Q/Y
13	SLA Compliance & Billing	SLA monitoring, SLA computation, and SLA-based billing generation for partners and end clients. Penalty % of O&M amount tracking.	Quarterly
14	Service Performance & Uptime Analysis	Service Availability, Downtime, Usage/Utilization, Fault & Rectification, Performance Statistics, and % Uptime Achieved.	As Required
15	Compatibility & Integration	NMS should support SNMP, JAVA, CORBA, XML, REST API, and integration with OEM APIs. The system must support both legacy and future technologies for seamless data exchange.	As Required
16	Any Other Reports	Within the reporting framework with flexibility of rapid customization.	As Required

The Bidder/PIA shall be responsible for developing a platform to support virtual inspections and user acceptance testing. The application shall be hosted at the S-NOC/SDC and integrated with NMS/EMS and GIS systems.

The platform must enable virtual field inspections from any location through a live video environment, allowing real-time monitoring.

All required infrastructure for the development and operation of this platform shall be within the scope of the Bidder/PIA.

2 MIS Report of Server storage:

Sr. No	Types of Reports	Periodicity
1	• Log of backup and restoration undertaken	Daily
2	• Summary of systems rebooted • Summary of issues / complaints logged with the OEMs. • Summary of changes done including major changes like configuration changes, patch updates (physical and virtual machines), etc. and minor changes like log truncation, volume expansion, user creation, user password reset, etc.	Weekly
3	• Summary of component wise uptime. • Log of preventive / scheduled maintenance undertaken • Details of Patch, updates, Vulnerability fixes released and implementation status of same • Details of break-fix maintenance undertaken	Monthly
4	• Consolidated component-wise availability and resource utilization. • Reports as directed by the State for SLA calculation	Quarterly

3 Manpower requirement For NOC (No Subcontracting is allowed):

The successful implementation, completion, and subsequent operation and maintenance of the services defined in this RFP require a team of highly skilled and experienced professionals. This section outlines the required manpower resources, along with their qualifications and expertise, to ensure successful project delivery and sustained network performance.

Sr. No	Designation	Qty	Education Qualification, Relevant Experience & Technical Certification	Roles & Responsibilities
1	**Systems Admin** **(On Payroll or Direct**	1	a) B.E. CE/IT or any relevant engineering discipline b) Minimum 5+ Years of Post Qualification experience in	Develop, manage, and maintain software applications within the data center. Ensure proper integration of applications with hardware and network

Sr. No	Designation	Qty	Education Qualification, Relevant Experience & Technical Certification	Roles & Responsibilities
	contract of SI)		software development/ system engineer/integration c) Relevant software development certifications	systems. Responsible for overall co-ordination with all deployed NOC and software resources.
2	**NMS Operations Engineer (API Expert)** **(OEM Manpower)**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification experience in NMS Product specialist/ API/ configuration, monitoring, and management etc. c) OEM Manpower	Integrate, Configure, monitor, and manage Network Management Systems to ensure network performance and reliability. Troubleshoot and optimize the NMS to maintain network integrity along with API integration
3	**NMS Operations Engineer (Development and DB Expert)** **(OEM Manpower)**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification experience in NMS Product specialist/ development, configuration, monitoring, and management etc. c) OEM Manpower	Designing, developing, and maintaining systems that monitor, manage, and optimize network infrastructure and database management.
3	**GIS Solutions Engineer** **(OEM Manpower)**	2	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification experience in GIS design, implementation, and maintenance c) OEM Manpower	Design, implement, and maintain GIS systems to analyze spatial and geographical data. Support network planning and management using GIS tools and techniques.
4	**OSS Integration Engineer** **(OEM Manpower)**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification in OSS systems integration and management c) OEM Manpower	Integrate and configure OSS systems to manage network operations, service delivery, and customer experience. Handle OSS-related issues and ensure seamless operation across platforms.

Sr. No	Designation	Qty	Education Qualification, Relevant Experience & Technical Certification	Roles & Responsibilities
5	**BSS Solutions Engineer (OEM Manpower)**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification experience in integrating and managing BSS systems c) OEM Manpower	Integrate and manage business support systems (BSS) to handle tasks such as billing, CRM, and order management. Ensure the alignment of BSS systems with other business processes in telecom or IT operations.
6	**Regulatory Expert**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification experience in regulatory liaison, audit compliance, and policy interpretation across telecom networks including NOC and data center	Implement and monitor Regulatory Compliance including TRAI, DoT, Licensing, Liaison Management, Documentation & Reporting, Risk & Audit Management
7	**Cyber Security expert - SME**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 5+ Years of Post Qualification experience in securing networks, cloud environments, and applications, with strong knowledge of cybersecurity frameworks.	Integrate and monitor Early threat detection, incident response, VAPT, Network, cloud, Application security compliance including CERT-in
8	**Cyber Security engineer**	1	a) B.E. CE/IT/EC or any relevant engineering discipline b) Minimum 3+ Years of Post Qualification experience in securing networks, cloud environments, and applications, with strong knowledge of cybersecurity frameworks.	Integrate and monitor Early threat detection, incident response, VAPT, Network, cloud, Application security compliance including CERT-in

Notes:

1. The above indicative manpower is needed during O&M phase. However, PIA is responsible for suitable manpower deployment during the implementation phase.
2. The above-mentioned manpower is minimum requirement as per the GFGNL. However, PIA has to ascertain the requirement from time to time to scaleup the manpower deployment.
3. PIA shall ensure to deploy of support staff equipped with Laptops, Printers etc., to carry out their regular office activities. GFGNL will provide the suitable seating arrangements.
4. Bidder must deploy dedicated resource for this project. All proposed manpower must not be deployed other than this project.
5. CVs of the proposed team shall be submitted to GFGNL. GFGNL deserve the right to interview and also reject any personnel during the onboarding or during the course of the project.

4 Warranty Support:

As part of the warranty services PIA shall provide:

1. PIA shall provide a comprehensive on-site OEM warranty of 10 years. warranty from (SI/OEM) as per the MAF.
2. Extended warranty can be provided by PIA on his own risk and cost basis.
3. PIA shall provide the comprehensive manufacturer's warranty and support in respect of proper design, quality and workmanship of all hardware, equipment, accessories etc. covered by the bid. PIA must warrant all hardware, equipment, accessories, spare parts, software etc. procured and implemented as per this bid against any manufacturing defects during the warranty period.
4. PIA shall provide the performance warranty in respect of performance of the installed hardware and software to meet the performance requirements and service levels in the bid.
5. PIA is responsible for sizing and procuring the necessary hardware and software licenses as per the performance requirements provided in the bid.
6. During the warranty period PIA shall replace or augment or procure higher level new equipment or additional licenses at no additional cost in case the procured hardware or software is not adequate to meet the service levels.
7. If the solution fully /partially fails during FAT, the PIA must repair or replace by equivalent or higher-level of new equipment at no cost to the tenderer after approval from GFGNL/GSDC.
8. Mean Time between Failures (MTBF): If during contract period, any equipment has a hardware failure on four or more occasions in a period of less than three months, it shall be replaced by equivalent or higher-level of new equipment by the PIA at no cost.For any delay in arrangement of replacement / repaired equipment's for inspection, delivery of equipment's or for commissioning of the systems or for acceptance tests / checks at each/ any site; GFGNL reserves the right tocharge a penalty.
9. During the warranty period, the PIA shall maintain the systems and repair / replace the components to keep the solution operational at the installed site at no extra charges to the

organization.

10. The PIA shall as far as possible repair/ replace the equipment at site.
11. Warranty should not become void, if DST/~~GIL~~GFGNL buys, any other supplemental hardware from a third party and installs it within these machines under intimation to the PIA. However, the warranty will not apply to such supplemental hardware items installed.
12. PIA shall monitor warranties to check adherence to preventive and repair maintenance terms and conditions.
13. PIA shall ensure that the warranty complies with the agreed Technical Standards, Security Requirements, Operating Procedures, and Recovery Procedures.
14. PIA shall have to stock and provide adequate onsite and offsite spare parts and spare component to ensure that the uptime commitment as per SLA is met.
15. Any component that is reported to be down on a given date should be either fully repaired or replaced by temporary substitute (of equivalent configuration) within the time frame indicated in the Service Level Agreement (SLA).
16. PIA shall develop and maintain an inventory database to include the registered hardware warranties.
17. To provide warranty support effectively, OEM should have spare depo in India and will be asked to deliver spare as per SLA requirement.
18. Management should be in HA, and required hardware, software, license and other components should be provided by PIA from the day-01.
19. Design, implementation should be done by OEM.
20. MIS reports should be submitted by PIAs as and when asked by GFGNL.
21. The bidder shall provide a centralized Data Analytics Platform capable of collecting, storing, processing and visualizing network operational data received from S-NOC systems. The solution shall support historical trend analysis, predictive analytics, anomaly detection, geographical visualization and dashboarding.
22. Matrix for Responsibilities on HCI:

Component	Recommended Responsibility
Space at DST	GFGNL
Physical Servers for NMS,GIS, OSS, BSS, Helpdesk, CRM	GFGNL
Storage Infrastructure for NMS,GIS, OSS, BSS, Helpdesk, CRM	GFGNL
Virtual Machine Resources for NMS,GIS, OSS, BSS, Helpdesk, CRM	GFGNL
Hypervisor Platform & Licenses for NMS,GIS, OSS, BSS, Helpdesk, CRM	GFGNL
DR Infrastructure Capacity	Need to delete
EMS/NMS Applications	PIA
Operating System Licenses & Support	PIA

Database (RDBMS) Licenses & Administration	PIA
Application Backup Configuration	PIA
Application Patching & Security Updates	PIA
HCI with Software and ~~VMware~~ Virtualization Software	PIA
Power at DST	GFGNL

56. Notes on Scope under Clause-5.15

The Successful Bidder shall provide, at its own cost, all environments, infrastructure, software, databases, licenses, tools, and related components required for development, testing, UAT, integration, migration, upgrades, security validation, operation, and maintenance of the proposed solution throughout the Contract Period. The Bidder shall ensure appropriate sizing and architecture of the solution to meet all functional, performance, security, business continuity, and maintenance requirements. No additional payment shall be made beyond the prices quoted in the Financial Bid and other provisions of the RFP.

Considering the critical and long-term nature of the Project, GFGNL reserves the right to conduct a Proof of Concept (PoC) and/or demonstration of the proposed solution at any stage either by self or it's authorized agency. The Bidder shall provide all necessary support and resources for the PoC. GFGNL's evaluation and decision based on the PoC/ demonstration shall be final, conclusive, and binding on the Bidder.

All available customer, network, RFMS, fibre allocation, route, and as-built records available with GFGNL shall be shared during handover. Wherever, feasible on execution, GFGNL shall provide the administrative details/documents support for network integrations.

The successful bidder shall ensure that all NMS/OSS/BSS/CRM/GIS/Analytics platforms etc. applicable for ABP project, associated software licenses, OEM subscriptions, patches, updates, support services, and maintenance required for the satisfactory operation of the BharatNet network are available and valid throughout the entire contract period. Any approved extension of the contract shall be governed by the applicable provisions of the RFP and mutually agreed terms at that stage. The bidder shall factor all costs related to software licensing, subscriptions, support, maintenance, patches, upgrades,etc. in its bid pricing in the financial bid of the RFP. No separate payment beyond the quoted and accepted contract price shall be admissible unless specifically provided under the Contract.Further, the bidder shall ensure availability of OEM support and software updates necessary for compliance, security, performance, interoperability, and functionality of the solution during the contract period. All version upgrades, updates, patches, and releases required to maintain the offered solution in a supported and operational state shall be included without any additional cost to GFGNL.

The bidder shall propose and size the Data Lake, Analytics, and integration solution considering existing and future network growth and other terms and conditions mentioned in the RFP.Bidder has to provide the solution based on the functional & technical specifications mentioned in the RFP for HCI.

Other than EMS and Datalake, all the NOC SW are to be hosted in SDC infrastructure which is in secured environment of SDC which includes WAF, GSOC tools including audit .So Bidders are not require to arrange the firewall and NDR.

5.16 VIDEOGRAPHY

5.16.1 Videography for all the works like trenching, fibre laying, splicing etc shall be conducted by PIA. The Video Recording (with Date/ Time stamping and GPS coordinates) of the OFC laying and Ducting works by the PIA shall be done in following phases as under-

a) Ducting - Video recording of Open Trenches is to be done using a Vertical Measuring Stick (Known as Measuring Staff in Civil Engineering Terms) at every 50 (Fifty) Mtr intervals. The depth reading in the Staff from top of the duct should be clearly recorded. In case of HDD (if the PIA is not using the machine recorded depth and produce the depth data), the depth of Entry & Exit pits should be Video recorded from top of the duct. The Couplers, Plugs and End Caps wherever required as per E.I. should also be captured in the video. Protection used as per E.I. in case of Low Depth should also be Video Recorded.

b) OFC Blowing/ Pulling - The OFC blowing process should be Photographed (geo tagged with time stamp) clearly showing the drum and fibre meter reading details.

c) Splicing- The splicing should be Photographed (geo tagged with time stamp) clearly showing that all 24F/48 F have been spliced and arranged in cassette.

d) Man Hole/ Cable Chamber- The Cable Chamber of MH base should be Photographed (geo tagged with time stamp) clearly showing the base plate of 50 mm thickness, RCC joint Chamber and Top Cover as per E.I. The cable loop also to be video recorded – showing start and end readings.

e) Route Markers- Route Markers should be photographed (geo tagged with time stamp).

5.16.2 All Videos/ Photographs (geo tagged with time stamp) shall be submitted /uploaded with a unique location related name in a folder with file descriptions clearly indicating each of the above activities like Ducting, Blowing, Splicing, MH/CC & RM.

5.16.3 The MP4 Video should have 3 windows running concurrently for following views-

(a) Window 1 – Physical work being carried out with Lat/ Long and Date/Time stamp

(b) Window 2 – Location of the activity on Google Map.

(c) Window 3 – KMZ/KML file with chainage, OFC route, Depth, Offset from road centre & Lat/ Long of Joint pits etc.

5.16.4 Each Video file should be of at least 2 minutes time duration capturing works being done for 40 Mtrs in case of Open Trenching and one shot in case of HDD. The size of each Video file should not be more than 30MB so that the same can be sent through mobile/mail etc.

5.16.5 The speed of movement of the camera while recording the Video should be maximum 20Mtr/Minute.

5.16.6 All Video recordings should be done in day light time without rain, fog, mist etc. Wherever, the video recording is not possible, photographs should be taken at every 10 meters with the approval of GFGNL/IE.

5.16.7 The nomenclature of the files should be in the following format:-XXXX_YYYYY: 12345_67890: Work

XXXX is the Route Abbreviation as per the Work Order

YYYYY is the Circle+District+Block Abbreviation as per the Work Order 12345 is the Chainage of start point of Video Recording
67890 is Chainage of end point of Video Recording

Work- OT Ducting- OTD, HDD, OFC Blowing- OFB, Splicing- OFC, MM/CC, RM etc.

5.16.8 Sub-Block end should be Chainage '0' and GP end should be taken as the last Chainage.

5.16.9 The Backend team of the PIA should merge all the files of a section of 40 meters in succession or HDD shot and send to GFGNL and IE for review / verification of works and GIS NOC Delhi for linking the same with GIS.

5.16.10 The payments of the works as per payment schedule mentioned in the tender shall only be done if the videos /photographs (geo tagged with time stamp) of the same as per this SOP are submitted to GFGNL team, IE and GIS NOC Delhi.

Note: i) GPS enabled Camera/mobile phone that can record Video with live tracking of LAT LONG (GPS Coordinates) and Date/ Time Stamping shall be used by the PIA. Video output resolution should not be less than 720dpi

ii) Since storage on cloud required for Videography which is to be done during Project phase. Further virtual inspection is also to be mendate from C NOC. Retantion of the data largely dependent on above two factors. Cloud storage shall be provided by PIA for videography storage till 100% project completion and 100% go-live or till further instruction by GFGNL/DBN.

5.17 MEASUREMENT

I. **Measurement Book (MB):** The measurement books are to be maintained by the PIA. The entry shall be made in ink. No entry shall be erased. If a mistake is made, it should be corrected by crossing out the incorrect words or figures and inserting the corrections, the corrections thus made shall be initialed & dated by the bidder. The measurement books shall invariably be consulted at the time of making final payments to the bidder. Here, Pls consider analogy of physical entry with digital entry. The PIA shall provide mobile application for the digital measurement book and it is responsibility of the PIA to abide with purpose of measurement /

penalty associated with this work.

II. Method of recording of nomenclature of items: Complete nomenclature of items, as given in the agreement need not be reproduced in the measurement book for recording the measurement but corresponding item code as provided, shall be used.

III. The measurements of various items of work shall be taken and recorded in the measurements book. The measurements shall be taken and recorded by bidder which will be countersigned by the authority appointed by GFGNL. The PIA shall be directly responsible for supervision of work and for accuracy of 100% of measurements. The IE will be responsible for conducting Acceptance Test (A/T) check of measurements at different locations on sample basis. The PIA shall re-do the work, wherever, the IE finds deviation from the entries in MB by the PIA or GFGNL at any subsequent stage during contract period. During subsequent inspection by GFGNL or any other agency, in case the sample measured data does not match with the measurement book entry up to a lesser depth of 5cm, penalty (equal to amount of difference of payment , so reduced due to lesser depth) shall be levied in addition to the reduction of payment due to lesser depth as per the approved formulae on each such default instance on the payment due for the link (waiver of penalty, if warranted, shall be decided by GFGNL on case to case basis) . The spirit is to ensure correct recording in the measurement book by PIA. GFGNL, on behalf of DIGITAL BHARAT NIDHI(DBN), reserve the right to get the work done at the risk and cost of the PIA in case of lesser depth cases.

IV. **Method of measurement:** The measurement of the work shall be done activity-wise as and when the item of work is ready for measurement. The methods of measurement of various items are enumerated as under:

- **Measurement of Depth of Trenches**. The cable route shall be divided into a number of segments each of maximum 200 Meters length bounded by identifiable landmarks at both the ends of the segments. If landmarks are not available, length of segment may be maintained at 200 Meters. The depth of trenching and ducting of OFC should be audited with IE or any of the third party agency nominated by the GFGNL , and approved based on recommendation by IE or any third party audit report after GFGNL due process .The measurement of depth shall be recorded at each point of measurement (POM) in the measurement book in Meters in the multiples of 5 cms. For example, 97 cms will be recorded as 95 cms and 103 cms as 105 cms. This will be by using mround formula in excel/ from backend software.The points of measurements shall be at a distance of 10 Meters starting from 0 (Zero) Meter. For example, if the length of segment is 75 Meters, the POMs shall be at 0 M, 10 M, 20 M, 30 M, 40 M, 50 M, 60 M, and 70 M. The last POM shall be at 75th M to be recorded against residual POM. Normally the workers tend to dig shallow trenches due to effort involved. As standard depth of the trench is important for future life and protection of cables, this tendency has to be discouraged.
- **Measurement of lengths and profiles of strata and protection.** The measurements of length of trenches are on running Meter basis, irrespective of type of soil encountered while digging. The type of protection utilized (item code – wise) to include RCC Half Round and Full Round Pipe, DWC HDPE Pipe, GI Pipe, MS Weld Mesh etc in a segment shall be recorded in the measurement book in the sheet provided for this purpose.
- **Measurement of length of cable.** The length of cables laid in trenches, through pipes and through ducts shall be measured by use of OTDR for the purpose of accuracy of the identification

of cuts during O&M. **The payment for such laying/trenching as per price schedule shall be made as per the RODO Meter readings and not as per the OTDR readings.** The length should be cross verified with the marking of lengths on the cables. The lengths shall be recorded in sheet provided in the measurement book.

- **Measurement of other items.** The measurement/ numerical details of other items shall be recorded in the sheets provided for respective items viz.

—Digging of joint pit/manholes and preparation of chambers along with details of its dimensions and location.

—Fixing, Painting and sign writing of route/joint indicators.

—Termination of Cable in equipment room and no. of joints.

—Record splice loss details for each joint.

- The bidder shall sign all the measurement recorded in the measurement book. This will be considered as an acceptance by the bidder, of measurements recorded in the MB. In case bidder fails to attend at the measurements or fails to countersign or to record the difference within a week, then in any such events the measurements taken by IE shall be final and binding on the bidder and the bidder shall have no right to dispute the same. In case of any discrepancy in the measurement book between the Independent Engineer (IE) and the bidder, the parties shall engage in mutual discussions to reconcile the differences. The agreed outcome shall be documented and submitted for final confirmation by GFGNL.
- Measurement of the work of cable for calculation of laying /trenching will be taken equal to the length of the pipe/ duct (as measured in the RODO meter) through which the cable has been pulled and not the total length of the cable pulled through pipe/duct.
- **Uploading of Depth Photographs:** The IE responsible for verification of MB shall take the photographs of the depth measurement being done at every 100 m in case of open trench work and at the entry / exit points in case of HDD method using BharatNet GIS App and upload the same on GIS platform.
- Compilation of the Measurement Book needs to be on real time basis while the work is being carried out.
- The details noted by the Contractor in the notebooks will be entered in the proper MB format in the computer on weekly basis and shared with GFGNL. These shall be checked by IE progressively so that as soon as the work of the route is complete, the MB is also ready.
- Depth AT and other tests/ observations to be done while the work is being executed. The PIA should ensure proper recording of all the details like drum Nos, duct roll numbers and length of shots(HDD) etc.

Note - The measurement and certification process shall be governed by the provisions of the RFP and the contract of the IE. The PIA shall maintain and submit measurement records in the prescribed format, duly supported by relevant evidence, for verification by the IE/GFGNL. The PIA shall maintain a Register capturing details such as but not limited to date, location, nature of hindrance, impact on execution, actions taken, and supporting evidence. However, the format and procedure for recording and validation of hindrances may be finalized during project execution in consultation with GFGNL/IE. Any claim for relief on account of hindrances shall be considered based on duly recorded and verified hindrance records and in accordance with the

applicable provisions of the RFP terms and conditions.

5.18 LAST MILE CONNECTIVITY TO THE VILLAGES (Revenue Village Connectivity)

a) Village connectivity beyond Gram Panchayats (GPs) shall be provided on demand for revenue villages through aerial linear OFC connectivity from the respective GP. For the purpose of this clause, “on demand” shall mean those villages where a minimum demand of five (5) home fiber connections has been registered on the BNU portal or as per the information provided by the State.

b) The PIA shall provide the Last Mile Connectivity to the Village from the nearest GP for provisioning of Revenue Villages by GFGNL at the quoted/ finalized price in financial bid line item in the table.

Note:Please note that the line item, The rates to be quoted by bidder shall include both CAPEX and OPEX charges (for 32 quarters). Following guidelines/ technical specifications shall be followed by the PIA:

c) Following guidelines/ technical specifications shall be followed by the PIA: -

i. The PIA shall use 6F Overhead OFC with structural cabling and all accessories and will applicable TEC GR(85200:2022 with latest Amended if any)) as mentioned in the table of TEC GRs in Annexure. Last Mile connectivity shall be implemented with 6F Aerial Drop Cable. However, the TEC GR mentioned for 12F/ 24F is applicable for 6F cable also allowed. For Last mile connectivity for villages 6F is required per GP.

ii. In aerial fibre connectivity if the pole does not have requisite bearing strength, then the LMCA will have to bring and set up his own 7 meter RCC poles dedicated for the OFC installation along with necessary accessories as per the Engineering Instructions.

iii. The OFC shall be laid using existing Electricity poles with required accessories wherever feasible and approved. TEC GR Standard No.: TEC 87060:~~2017~~ 2024 including its latest Amended, if any, may be referred.

iv. Payments, if applicable, to the electricity authority shall be undertaken by GFGNL. The PIA shall ensure full cooperation and field-level assistance for all related activities such as billing, meetings, and feasibility studies,etc. Note - Applicable payments to the electricity authority shall be undertaken by GFGNL, while the PIA shall provide all required coordination, documentation, field assistance, and follow-up support. In case of delays attributable solely to the electricity/utility authority, despite timely fulfillment of the PIA's obligations and submission of adequate documentary evidence, suitable exclusion from related LD/SLA penalties may be considered by GFGNL on a case-to-case basis. However, delays arising due to any act, omission, or non-compliance by the PIA shall remain the responsibility of the PIA.

v. Wherever, such electricity poles are not available/used, the PIA is required to erect ~~wooden/ G.I.~~ 7 Meter RCC poles at the required intervals so that the OFC withstands normal climatic disturbances.

vi. Wherever the existing electricity poles are not available; the PIA shall erect a 7 Meter RCC

pole. Payment of the quoted/ finalized price, of the Price schedule of related line items, shall be made for such RCC Poles, including supply, installation and O&M for the entire contract period, on uploading of the video as per specifications. The PIA shall have to replace such poles damaged for any reason whatsoever during the contract period without any additional cost to GFGNL.

vii. It is the PIA's responsibility to maintain & manage overhead Cable without dieluting uptime/ SLA.

viii. The PIA is required to terminate such OFC at an appropriate location in the village in a minimum 12 Pair FTB (TEC/GR/TX/FTB-02/02/APR-2010 with latest Amendeds if any and RFP requirements) and at the GP FDMS/FTB from where connectivity extended to revenue villages either with a new mini-OLT or using splitters and the mini- OLT installed at the GP.

ix. The PIA shall also be liable to maintain the above arrangement till the completion of the entire contract period.

x. Payment of 40% of the quoted /finalized price shall be made after successful commissioning of first FTTH connection.

xi. Payment of 7.5% of the quoted/ finalized price shall be made every year, during next 8 years, after the completion of Financial Year in which the first FTTH connection is provided. This payment shall be made quarterly as 1.875% only, on achievement of quarterly SLA of 97% or better for such connectivity, However, the payment will be reduced as per table below, if 97% uptime in the quarter is not maintained. No payment will be made for the quarter, if the uptime for that village connectivity is below 80%.

S. No	SLA	Quarterly Payment as percentage of the quoted/ finalized price
1	=>97%	1.875 %
2	From =>95% to <97%	1.7%
3	From=>93% to <95%	1.4%
4	From=>90% to <93%	1.0%
5	From=>85% to <90%	0.5%
6	From=>80% to <85%	0.3%
7	<80%	Nil

xii. The O&M payment to the PIA for the concerned Block shall not be released, till all such villages for which the work orders in the block have been issued are provided with connectivity within 30 days of the work order. A penalty of Rs 100/- per day of delay beyond 30 days shall be levied, unless the exemption is given by GFGNL on case-to-case basis with proper justification for the reasons beyond the control of the PIA. Maximum penalty for delay in connectivity to the village shall be capped at 12% value of the O&M invoice for each quarter for that Block. Further, GFGNL, on behalf of DBN, shall have the right to get the work done at the risk and cost of the PIA in case work is not completed in 100 days.

xiii. For the Acceptance Testing of such last mile implementation, only the quality of the OFC,its termination at both the ends and measurement of ideal optical power (as per standard)shall

be done. The construction practice shall not be part of acceptance testing as the PIA shall be responsible for O&M of the entire end to end construction during the entire contract period.

xiv. If the implementation through OFC is not feasible, the PIA can plan the implementation using UBR at the quoted/ finalized price, as per Sr. No. mentioned in the Price schedule. However, if required, the PIA can use the poles as specified in Sub-Clause (x) on cost basis along with other terms and conditions.

xv. The villages, where last mile connectivity is not feasible either using OFC or UBR, the same shall be descoped after recommendation of IE and approval of GFGNL.

xvi. The entire quoted/ finalized price of Last Mile Connectivity is split in the ratio of 68:32 against CAPEX: OPEX charges. Thus, 1% of the price shall be paid per quarter, as OPEX of that quarter and remaining 0.875% shall be paid against CAPEX out of total 1.875%, mentioned in sub-clause (viii). If GFGNL orders the Last Mile Connectivity to a village, after two years or later, from the appointed date, the left-over balance of the CAPEX part shall be paid in the last quarter of the contract period. It may be noted that this payment will be made after deduction of penalties over the contract period, if any. Thus, total payment over the entire contract period i.e. till termination or closure shall be 68% (as CAPEX) + 1% multiplied by number of quarters of completed O&M, (minus penalties).

xvii. In case of implementation of Last Mile Connectivity through OFC, the cable length shall be measured through OTDR for payment purpose. The point-to-point distance between GP and village shall also be calculated using GIS coordinates (Lat/Long) for verification. If, the OTDR measured length is more than the GIS length by 20% or more, IE/ GFGNL shall do the due diligence before making the payment based on OTDR length. This measurement (based on OTDR) is only for Last Mile OFC. Payment for Construction, O&M etc. (under middle mile network) shall be made as per actual route length based on rodo-meter (as per FootNote-1 under Price-sheets).

xviii. For the existing connectivity of horizontal/ LMCA customer connectivity, if required, GFGNL reserves the right to handover to the selected PIA for O&M connectivity, based on the rate discovery through this tender.

xix. The quantity of approximately 4,141 Revenue Villages are indicative and may vary. The connectivity shall be executed strictly on a demand basis and subject to approval by GFGNL/Competent Authority. Payment shall be made only for the actual number of Revenue Villages connected and accepted in accordance with the applicable provisions of the RFP terms and conditions. However, GFGNL reserves the right, based on project requirements, Government directives, network planning considerations, or BharatNet objectives, to add, delete, substitute, reprioritize, or modify the list/counts of Revenue Villages during the contract period.

xx. Creating the last mile media(wireline/wireless) through alternate technology(like wireline on drop cable with termination of Compass without CPE, or Wireless media)will be in the scope of PIA, this includes SITC and O&M activity during the entire contract duration.

5.19 LAST MILE ENTERPRISE HORIZONTAL CUSTOMER CONNECTIVITY

In order to deliver digital services and connectivity to Offices / Institutions like Cooperatives, PSUs,CID Branches/other offices of Home Department, Property Registration Offices, Transport Department, Health Department Offices, Education Department Offices, District Offices, and other Offices working under Government of Gujarat, GFGNL has already empanelled few of the partners through the horizontal customer connectivity/ Last mile connectivity agencies for supply, installation, test, commission and O&M.

The details of existing connected infrastructure details are mentioned below developed under the horizontal / last mile customer connectivity along with media.

GFGNL	Type Of Connectivity					Total
	UBR	ADSS/Aerial	UG	Cat-6	Li-Fi	
*HPIA	49	8194 (Non-Structural)	33	389	6	8671
*LMCA	167	607 (Structural)	43	21	-	838
Total	216	8801	76	410	6	9509

*HPIA= Horizontal Project Implementation Agency, *LMCA= Last Mile Connectivity Agency

The above-mentioned counts are indicative and represent the horizontal customers onboarded under BharatNet Phase-II up to the date of issuance of this RFP. Additional customer onboardings are currently in progress, and therefore the actual counts may vary during the contract period. The Operation and Maintenance (O&M) of all such sites, including existing and newly onboarded sites during the contract tenure, shall be within the scope of work of the Project Implementation Agency (PIA) selected through this RFP.

In the event of non-performance of the existing Horizontal/LMCA agency, or upon expiry/termination of the existing contract—whichever occurs earlier—GFGNL reserves the right to transfer the existing connectivity services to the selected Project Implementation Agency (PIA) for Operations and Maintenance (O&M) of the existing customer base and / or new connectivity establishment.The existing customer base predominantly comprises Government and enterprise customers.In this context, the PIA selected through this bidding process shall assume sole responsibility for the operation, maintenance, and upkeep of the already commissioned last-mile network and the cases for newly developed sites. The PIA shall ensure continuity of services and adherence to the defined Service Level Agreements (SLAs) for the entire duration of the contract. Bidder will be responsible to submit the separate PBG on assigning workorder for lastmile enterprise horizontal customer connectivity O&M is assigned. Notwithstanding anything contained elsewhere in this RFP, GFGNL reserves the right, subject to the approval of the Competent Authority, to allocate, reallocate, transfer, or withdraw the implementation and/or O&M scope pertaining to Enterprise Customer last-mile connectivity from PIA, either in whole or in part, based on business exigencies, customer requirements, network optimization needs, performance considerations, or public interest. The decision of GFGNL shall be final and binding on the PIA. The PIA shall be responsible for the operations of the network entailing the following:

5.19.1 Maintenance Phase

5.19.1.1 Periodical Maintenance

I. **Periodical Maintenance:** The agency shall carry out periodical maintenance of the network commissioned with such frequency that each customer is covered once in every Quarter atleast, as well on specific sites ask by the tenderer. The agency shall submit the report on quarterly basis during this phase. Format of periodical maintenance report must be agreed and approved by GFGNL.

II. **Corrective Maintenance**: If any issue is reported by the end user or from Gram Panchayat (GP) with regards to the services, then the issue shall be reported to centralized help desk of NOC of State/GFGNL and if there is any issue in the horizontal/enterprise last mile customer network connectivity, the issue shall be forwarded to the respective PIA. These issues shall be rectified to restore the services as per the SLA.

III. The Goods supplied & installed under this Contract shall be fully insured by the selected Bidder, against any loss or damage at the Tenderer's designated location for entire contract period. The insurance taken should cover risks such as flood, theft, fire, earthquake, and cyclone (for wind speeds up to ~~120 kmph~~ 150 Kmph in normal area and minimum 180 Kmph in coastal and Kutch area.). The Bidder shall submit to the TENDERER, certificate of insurance issued by the insurance company, indicating that such insurances have been taken against entire solution & certificate has to be submitted by Bidder to TENDERER. Bidder shall be designated as the 'loss payee' in such insurance policies; Bidder shall be liable to pay premium for the insurance policy & shall ensure that each & every policy shall keep updated from time to time till end of contract period. In case of delayed procurement of insurance from selected Bidder, all responsibilities of all supplied and/or installed equipment will be on Bidder before taking the insurance.

IV. The Bidder shall bear all the statutory levies like customs, insurance, freight, etc. applicable on the goods during their shipment from respective manufacturing / shipment site of the OEM to the port of landing.

V. All charges like transportation charges, octroi, etc. that may be applicable till the goods are delivered at the respective site of installation shall also be borne by the Bidder.

VI. The Bidder during the term of this contract undertakes to ensure that it has taken or shall take up all appropriate insurances for the goods that it is required to undertake under law as well as to adequately cover its obligations under this Contract: shall take out and maintain, at his own cost insurance with IRDA approved insurers against the risks, and for the coverage, as specified below: shall pay all premium in relation thereto and shall ensure that nothing is done to make such insurance policies void or voidable at the Tenderer's request, shall provide certificate of insurance to the Tenderer showing that such insurance has been taken out and maintained. Employer's liability and workers' compensation insurance in respect of the Personnel of the Bidder / Bidder's Team, in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate; and Insurance against loss of or damage to (i) equipment or assets procured in full or in part for fulfilment of obligations under this Contract (ii) the Bidder's assets and property used in the performance of the Services.

VII. In case of theft of any asset, successful Bidder(s) will have to carry out all required process to lodge police complain / FIR. TENDERER will assist Bidder(s) wherever required.

VIII. In issues pertaining to OFC/PLBE Cable/ Wireless link/LM(last mile) connectivity due to poor workmanship and other technical reason the fault has to be rectified or cable/PLBE pipe/wireless

link/LM Connectivity has to be replaced by PIA. In case of cable cut (due to any circumstances including but not limited to cut by animals and/or other third-party vendors etc.) due to any reason the fault to be rectified by the PIA and services to be restored as per defined SLA. All the store and spares required for such restoration to be borne by the PIA.

IX. In case of pole fallen/damaged or any material damaged/cable cut/theft PIA is responsible to restore the link within SLA with parallel process of FIR, etc. without any cost to GFGNL.

X. During maintenance of the network, PIA shall ensure that all fibre cores are spliced at the cut location (and not only live fibre cores) during rectification process. GFGNL may ask/audit the health / continuity of all fibre cores at any time and PIA will have to facilitate this exercise by performing LSPM and OTDR testing in presence of this team.

XI. Any disconnection request received from customer (government institutes) due to quality issues, will be recovered from PIA as a part of penalty by recovering that site Opex value from PIA.

XII. PIA has to provide O&M services to existing customer delivered by GFGNL, O&M charges will be given based on the discovered rate *in financial table 1C in the section of financial bid criteria.*

XIII. Carry out operation & maintenance of the last mile link including all the field activities required (preventive & corrective maintenance) to keep all the links up & running. It will be successful Bidder(s)' responsibility to rectify / restore the link in case any cable/link(wireline-wireless) is damaged due to road widening, construction of bridges, culvert less than or equal to 100meter section it will under the bidder's O&M scope, while for more than 100m sections or change in RoW due to utility (like in case of drainage/water pipeline project etc) or aerial damage due to major EB pole shifting work / by any third party /due to any other field challenges within defined timeline. However, the Bidder can raise a reimbursement request in particular cases where the situation is beyond the control of Bidder. The GFGNL competent authority will take further decision on reimbursement request based on valid proof submission. The decision made by GFGNL will be considered as final.

XIV. To mitigate risk from power fluctuation, or aging or other causes of device failure, the PIA shall besides keeping the necessary spares, obtain necessary warranty and AMC support from the manufacturers of all components.

XV. Maintenance, support services, warranty, annual maintenance contract etc. in respect of equipment supplied to the customer. All the active equipment(both for wireline & wireless supportive), 6U/3U rack, Media Converters must be supplied with warranty of 7 years and all required licenses.

XVI. Any Customer Premises Equipment (CPE) including its backhaul for horizontal customer connectivity,i.e., from GP to end customer that becomes defective, obsolete, or non-functional due to end of warranty/AMC from the date of installation shall be replaced by the successful bidder at its own cost as part of the Operation & Maintenance (O&M) obligations for the contract period, ensuring continuity of services without degradation of performance.

XVII. All inventories supplied under the BharatNet Project shall remain the property of DBN/GFGNL. The PIA shall be solely responsible for the safety, security, custody, and proper storage of all such inventories against loss,theft,etc. throughout the contract period and subsequent extension.

XVIII. Inventories details including OEM are enclosed in the annexure on website/ procurement portal for LMCA and horizontal.

5.19.1.2 Audit and Security Services

I. The PIA shall be required to provide comprehensive support to GFGNL during any kind of audit. The PIA shall be responsible in getting the required readiness built in the network during audit for physical and logical security solutions.

II. GFGNL or its authorized Bidder may inspect, monitor and assess the progress and performance of the project besides by itself as and when feasible. State/SIA may demand and upon such a demand being made, State/SIA shall be provided with any document, data material or any other information which it may require, to enable it to assess the progress of the project.

III. State/SIA shall also have the right to conduct, either itself an audit to monitor the performance of the PIA of its obligations/ functions in accordance with the standards committed to or required by State/SIA and the PIA undertakes to cooperate with and provide to State/SIA all documents and other details as may be required by them for this purpose without any extra cost to GFGNL.

5.19.1.3 Network Inventory

~~i. To mitigate risk from power fluctuation, or aging or other causes of device failure, the PIA would be required to maintain an inventory of all the components used in the network and the required spares quantities must available at the different levels of geographical regions(district/zones/nearby locations) to manage the SLA and customer uptime of all elements during the entire contract duration.~~

i) The PIA would be required to maintain an inventory of all the components used in the network and the spares available at the different levels and locations in the proposed inventory and asset management tool. Warehouse for keeping the spares at BHQ/DHQ shall be in scope bidder.

ii) If spare quantity is used due to device fault/operational issue, the cost is to be borne by PIA.

5.19.1.4 Other Maintenance Activities

i. Any change in existing last mile enterprise customer connectivity media, after restoring on permanent solution. PIA has to ensure to check the link stability and then update the database in GFGNL's GIS withing 48 Hrs and in NMS on day-01(i.e., within 24 Hrs) by taking acceptance approval from GFGNL officials.

iii) PIA have atleast 1 member per 200 connections on field at district level to operate field operation. Bidder may increase manpower counts in the future including field FRT Team if required to maintain field activities and to maintain the SLA with approval from GFGNL without any cost to GFGNL.

iv) The Bidder shall ensure proper takeover of all activities from the existing agencies for horizontal and lastmile connectivity within first month of signed workorder(APO). The GFGNL will support administratively wherever feasible. The Bidder shall complete a comprehensive knowledge gain in the first month, including all field-level and network inventory details, along with relevant documentation.Further, within the first month (i.e., 30 calendar days) with the HoTo process, the Bidder shall submit the following documents,: One (1) complete set to the concerned local GFGNL authority and One (1) complete set to GFGNL Head Office, Gandhinagar

The documents shall include, but not be limited to:

- Network Diagrams
- Warranty Documents
- Operation & Maintenance Manuals
- FAT (Factory Acceptance Test) / UAT (User Acceptance Test) Reports
- OTDR (Optical Time Domain Reflectometer) Reports
- ABD (As-Built Drawings)
- Any other relevant technical or project-related documentation

The above list is indicative and not exhaustive. GFGNL may, based on project requirements, request additional documents/reports, which the Bidder shall be obligated to provide without any additional cost to GFGNL.

The submitted documents will be reviewed for any corrections, feedback, or completion requirements to facilitate closure of pending activities, if any.

v) PIA has to ensure any customer link will not down for more than 2 days, failure to this GFGNL will have all the rights to recover amount from the payables/SD/PBG of the Bidder.

vi) Bidder will be responsible to supply & install power cable from tapping point to rack as per site requirement at no additional cost to GFGNL.

vii) In case, proper earthing is not available at GP/customer location, Bidder will be responsible to supply & install power cable from tapping point to rack as per site requirement at no additional cost to GFGNL.

viii) Bidder has to ensure the proper visibility of each node to be integrated with PIA's NMS either through SNMP, API or any other suitable mechanism.

ix) Bidder will have to supply EMS (Element Management System) for each active components like but not limited to radios, router, switch, Mini-OLT/ONT etc. used in network so that required alarms can be monitored and also remotely monitor to know atleast the OFC Cut Issue, Power Issue(Utility),Equipment- cold Start, warm Start, link Down, linkUp, authentication Failure, latency, Jitter and Neighbor Loss status related performance parameters, Proactive alarms of each equipment integration in network and mapped in Bidder's NMS on or before the SNOC integration time lines or the existing GFGNL onboarded agencies exit management whichever is earlier.

x) Bidder has to provide all active elements and its network performance like but not limited to, Services, link performance- Availability(Up/Down) including reason of outage-alarm Management, Throughput, latency,packet drops, jitter,Tx-Rx level ,For Wireless (RSSI) etc. through EMS (preferably licencense based EMS) and integrate with SNOC NMS either through API or by providing suitable mechanism without any additional cost to GFGNL.

xi) PIA shall provide a digital dashboard to GFGNL on this parameters including SLA/KPI mentioned in the RFP.

xii) The Bidder shall ensure:

- Proper mounting of ONT/ any other equipment inside rack or wall as applicable
- Power connectivity with proper MCB protection
- Fiber termination and patching
- LAN connectivity to switch/router

- Configuration as per SNOC / GFGNL provisioning guidelines
- Labelling and documentation

The Bidder shall coordinate with GFGNL /SNOC for provisioning and activation of services.

xiii) The Bidder shall maintain proper inventory records and submit acknowledgment of all existing inventories.

xiv) A TT will be considered closed only after confirmation from the end customer.

xv) MIS Reports: Details of MIS reports to be submitted by PIA during the entire O&M phase with agreed format to state/GFGNL official. Following are the few indicative reports but not limited to,

MIS reports during O&M of Last Mile Enterprise Customer Connectivity:

Sr. No.	Report Type	Periodicity
1.	Availability of Devices live vs faulty	**Weekly**
2.	Total No. of complaints raised	
3.	Ageing Report of issues/Complaints/Incidents	
4.	Receive Signal Strength at LM including connectivity media(indicating an alert if the signal strength is below the defined threshold)	
5.	Bandwidth Utilization (max, min and average)	**Weekly**
6.	Software upgrade/enhancement reports per network element	**Monthly**
7.	Configuration change reports	
8.	Attendance report of field manpower	
9.	SLA compliance reports	**Quarterly**
10.	Preventive maintenance reports	
11.	Scheduled maintenance reports	
12.	Inventory reports	
13.	Service Availability, Downtime, Usage/Utilization, Fault & rectification, Performance statistics-, Log of Network parameters along with Service down time and % uptime achieved	
14.	Summary of fault/complain reported and pending at different bucketization including at GFGNL end along with brief data details	**Daily/Weekly-Monthly Summary**
15.	Any other reports- As and when required by Tenderer	

Note: The PIA shall submit the all above reports as mentioned on a regular basis over e-mail and as per the prescribed formats provided by the GFGNL. Delay in the billing process due to non-adherence of above compliances/report submission will be sole responsibility of the Bidder.

~~5.19.2~~ Scope of Work (SoW) for GFGNL

I. GFGNL shall bear and support the payment of power consumption charges at the Gram Panchayat (GP) locations. Coordination with the concerned electricity departments for payment release of connections shall be within the scope of GFGNL.However, during the O&M period, in the event of any power outage, the responsibility for coordination with the respective electricity authorities for restoration of power supply shall lie with the PIA.The PIA shall ensure that power is utilized strictly for project-related infrastructure and operations. Any unauthorized usage, misuse, diversion of electricity, or involvement in fraudulent practices such as meter tampering, illegal connections, or usage beyond approved purposes shall be strictly prohibited.

In case any such malpractice or fraudulent activity is detected:

a. The PIA shall be solely responsible and liable for all penalties, fines, legal consequences, and recovery of losses imposed by the electricity department or any statutory authority.

b. GFGNL shall not bear any financial or legal liability arising out of such acts.

c. GFGNL reserves the right to impose additional penalties, initiate contractual action, or terminate the agreement as per applicable terms and conditions of the contract.

The PIA shall also maintain proper records/logs of power usage where required and fully cooperate with inspections or audits by GFGNL or statutory authorities.

II. Any replacement or provisioning of Optical Network Terminals (ONTs) for horizontal customer connectivity shall be strictly compatible with the make and model of the parent Optical Line Terminal (OLT) deployed in the network. Similarly, all other active devices, including but not limited to Wi-Fi CPEs and associated equipment, shall be interoperable and fully compatible with the existing network infrastructure and devices to ensure seamless integration and performance. Further, the selection, procurement, and deployment of such equipment shall comply with all applicable Government procurement policies, guidelines, and standards.

III. As a general principle, GFGNL shall not permit tapping, branching, or any form of unauthorized access to:

- Existing Optical Fiber Cable (OFC) infrastructure laid for Gram Panchayat (GP) connectivity; and
- Newly laid OFC infrastructure for GP-to-GP, GP-to-Sub-Block, or Sub-Block-to-Sub-Block network connectivity.

The primary objective is to preserve the integrity, redundancy, and reliability of the Sub-Block and GP ring architecture and to ensure uninterrupted network performance.

However, the existing fiber infrastructure laid for horizontal customer connectivity from GP locations may be utilized by the new PIA for extending services to customers, subject to:

- Field feasibility and technical validation; and
- Prior written approval from the competent authority of GFGNL.

Notwithstanding the above, GFGNL reserves the sole and absolute right, at its discretion, to permit tapping, modification, or alteration of the network topology or transmission media, based on:

- Valid technical or operational justification; and

- Considerations of long-term sustainability, scalability, and ease of governance of the network.

Any such modification shall be undertaken only with prior written approval of GFGNL and in compliance with prescribed standards, and the PIA shall ensure that such changes do not adversely impact network performance, redundancy, or service quality.

Unauthorized tapping or alteration of the network shall be treated as a material breach of contract and may result in penalties, suspension, or termination of the agreement, as deemed appropriate by GFGNL.

IV. GFGNL shall not pay any extra cost for transportation of the delivered items for installation, commission and O&M of the respective locations.

~~5.19.3~~ O&M SLA & Penalties

I. These SLAs shall be effective immediately after mutual agreement/assign WO(APO) between PIA and GFGNL on decision to handover of existing horizontal and LMCA customer connectivity to selected PIA, and will be calculated per GP on a monthly basis as per SLA parameters given below.

II. Considering that most sites (such as schools and rural premises) operate primarily during daylight hours, the standard working hours shall be from 06:00 AM to 08:00 PM, and non-working hours from 08:00 PM to 06:00 AM.Appropriate relaxation in uptime or related service obligations during non-working hours may be considered, subject to submission of valid supporting evidence and approval from GFGNL.

III. For the purpose of these calculations a connection failure shall be defined as a last mile end CPE being unable to connect to the GFGNL network.

IV. GFGNL will pay to selected Bidder on discovered O&M charges of any particular active site / location every year as an O&M charge for operation & maintenance activities for that location. GFGNL will make O&M payment after deduction of any applicable penalties.

Proposed quarterly SLA Uptime / Availability of link per location & penalties thereof		
Sr. No	**Uptime**	**Penalty**
1	>= 98.0%	Nil,
2	>= 97.00% & < 98.0%	5% of quarterly opex charges will be deducted for respective site
3	>= 96.00% & < 97.00 %	7% of quarterly opex charges will be deducted for respective site
4	>= 95.00% & < 96.00 %	10% of quarterly opex charges will be deducted for respective site
5	>= 94.00% & < 95.00 %	13% of quarterly opex charges will be deducted for respective site
6	>= 90.00% & < 94.00 %	15% of quarterly opex charges will be deducted for respective site
7	< 90%	20% of quarterly opex charges will be deducted for respective site

v) GFGNL reserves the rights to forfeit the PBG of selected Bidder and may initiate the process to terminate the contract, In case of SLA Non-compliances beyond the maximum penalty limit defined in LM OPEX criteria, and/or O&M SLA performance below 90% for any 3 Quarters.

vi) In addition to the above-mentioned penalty wherein average quarterly uptime % will be calculated for each site / location, below mentioned penalty will also be applicable.

vii) If any site / location will be down for more than 48 Hrs. due to any reason attributable to the Bidder(s), an additional penalty Rs 500per day per location will be levied.

#	Fault Work Type	Time Duration	Penalty
1	Site Down More than 48 Hrs in EMS/NMS	2 working Days	If any site / location will be down for more than 48 Hrs due to any reason attributable to the Bidder(s), an additional penalty of Rs 500 per day per location will be levied

viii) In case of any fault arises in the installed items during the warranty period of five years, Bidder is requiring to either repair the faulty items or have to install the replacement (complying to the RFP specification) for faulty material without any additional cost to the GFGNL.

ix) The Bidder shall ensure immediate temporary replacement of any faulty equipment provided to end-users during the O&M period, without any additional cost to the Government of Gujarat/GFGNL.For this purpose, the Bidder shall maintain an adequate inventory of spare equipment to meet replacement requirements and ensure continuity of services.

x) Relaxation or exclusion from deliverables and associated obligations may be granted in cases such as school vacations, confirmed site access or premises constraints, natural calamities (including cyclones), or other force majeure–like conditions, subject to submission of valid documentary evidence and prior approval from the competent authority of GFGNL.

xi) Considering the rural nature of project areas in Gujarat, additional exclusions may be allowed in genuine circumstances such as heavy rainfall, flooding, or site inaccessibility at schools or other premises, duly supported with proof and approval from GFGNL.

xii) The Bidder shall obtain and maintain comprehensive insurance coverage for all goods supplied and installed under the contract, covering the entire contract duration. The insurance shall protect against risks including, but not limited to, flood, theft, fire, earthquake, and cyclone (for wind speeds up to 120 kmph), storm at the designated location.

xiii) Bidder during the contract duration related capitals/materials has to manage their own warehouse, GFGNL or its authorized Bidder may visit sample base audit for which end to end responsibility is with Bidder which also includes the packing, un-packing of material, fire-safety precautions, providing unique identification numbers/serial numbers/ mac-addresses of each elements .

xiv) For the Calculation of SLA's, the site / customer location shall be taken as unit.

xv) The performance report for each site / customer location shall be generated from the measurement tools (Bidder's NMS & Helpdesk tool as well as customer feedback and observations will be considered).

xvi) Maximum penalty ceiling for any particular site / location shall be equal to 20% of the total quarterly opex charges to be paid for respective site for horizontal enterprise customer connectivity. However, in the event that this cap of 20% is reached for two consecutive quarters or error/delay in digital dashboard during the contract period, the Tenderer shall have the right to either, initiate contract termination proceedings on account of sustained non-performance; or at its discretion,

extend the penalty cap to 40% of the quarterly invoice value for the subsequent two quarters. Further, If performance does not improve during this extended period, the Tenderer may proceed with termination of the entire contract or part of.

xvii) Bidder may increase manpower counts in the future including field FRT Team if required to maintain field activities and to maintain the SLA with approval from GFGNL without any cost to GFGNL.

xviii) In case of non-performance in the O&M part for H-connectivity, GFGNL reserves the rights to handover O&M to third party or other mechanism.

xix) The O&M Teams shall operate on a 24x7 basis and coordinate directly with GFGNL SNOC and district authorities.

xx) The Bidder shall strictly adhere to Environmental, Health and Safety (EHS) standards. The Bidder shall not dump cable drums or waste materials in public places. All work sites shall be restored to original condition.

xxi) Any penalties imposed by authorities due to negligence of the Bidder shall be borne by the Bidder.

xxii) The selected PIA shall be responsible for seamless migration and onboarding of all existing active elements, services, configurations, alarms, performance parameters, and inventory data from the existing EMS and NMS platform(s) to the proposed EMS and NMS solution. Such migration shall be carried out without disruption to network operations and without degradation of existing SLA/KPI performance levels.

xxiii) The PIA shall plan, execute, test, validate, and document the migration process in consultation with GFGNL, the existing service provider(s), and/or its authorized agency wherever applicable. Any licenses, tools, adapters, APIs, professional services, integration efforts, or additional components required for successful migration shall be included in the scope of work and quoted prices.

xxiv) The migration shall be completed within the timelines specified in the RFP under the section of NOC delivery timelines. Until successful migration and acceptance, the PIA shall ensure uninterrupted monitoring, reporting, fault management, performance management, and service assurance functions to end customers.

xxv) Any failure to achieve seamless migration or any adverse impact on network performance, service availability, SLA/KPI compliance, or reporting obligations attributable to the PIA shall be treated as non-compliance under the Contract and shall attract applicable penalties, LD, or other contractual actions.

~~5.19.3~~ 5.19.4 OPEX Payment

I. O&M payments for last mile enterprise and horizontal customer connectivity shall be made in accordance with the Payment Terms of the GFGNL network, subject to compliance with applicable Service Level Agreements (SLAs) and deductions of penalties, as specified in this RFP.

II. The PIA shall be responsible for providing O&M services to all existing customers connected under the GFGNL network. Payment for such services shall be made based on the rates discovered under Financial Table 1C of the Financial Bid.

III. The PIA shall submit valid quarterly invoices for O&M services rendered to last mile enterprise and horizontal customers. All payments shall be processed after verification and shall be subject to applicable SLA compliance and deduction of penalties as per the terms and conditions of this RFP.

Payment Terms

a) All invoices shall be subject to verification and certification by GFGNL before release of payment.
b) Payment shall be released within 45 days from the date of submission of complete and approved invoice along with required supporting documents.
c) Rates quoted by the Bidder shall remain firm and fixed for the entire contract period, and no escalation shall be permitted under any circumstances.
d) All payments shall be released after certification of delivery, installation and acceptance tests per the Deliverables.
e) All payments shall be made in Indian rupees only (INR).
f) Payment shall be released against the invoices raised by PIA on providing all relevant documents timely, including preventive, corrective measures, duly signed and approved by GFGNL authorized agency / or its nominated representative, insurance copy and are complete in all respect and subsequent approval.
g) Payment shall be subject to deductions of any amount for which the supplier is liable under the RFP conditions. Further, all payments shall be made subject to deduction of applicable taxes and other Government levies like TDS (Tax Deduction at Source) and etc., as per the current Income-Tax Act.
h) All payments shall be released only after deducting all SLA Penalties as applicable.

~~5.19.4~~ 5.19.5 VIP/ Major / Ad-Hoc Events

a) GFGNL reserves the absolute and unconditional rights, at its sole discretion, to require the selected PIA/Bidder to provide support for the development, deployment, operation, and maintenance of telecommunications infrastructure for temporary VIP event connectivity. The selected PIA/Bidder shall be mandatorily obliged to comply with such requirements, including provisioning of resources, manpower, and services, without demur or delay, as and when directed by GFGNL, under the same terms and conditions of the Contract. No additional claims, objections, or refusals shall be entertained in this regard.
b) The events in the government functions are highly sensitive and related to VIPs and hence, as a creadible bidder it is expected that the link as well as other necessary items limited to connectivity is the basic expectation from the bidder. The Bidder may be custodian of the spare assets and certainly bidder will be owner of the any new asset of that particular event.
c) Timeline will be immediate basis (maximum to 24 Hrs to 48 Hrs) for deploy connectivity on temporary basis as per the requirement of GFGNL's customer.
d) For New connectivity PIA may opt for either aerial method or through proper UG method or through Wireless connectivity based on the site feasibility and service requirements, keeping the 100% network availability as the design criteria. For connectivity media GFGNL shall be consulted prior to the execution by the PIA for the network media.
e) Selected bidder has to maintain and reserve the sufficient spares materials in advance for these type of connectivity requirements.

f) At the time of event, bidder has to ensure the 24*7 surveillance of the event and has to maintain 100% service network uptime. For this, sufficient resources field and backend support team for online close monitoring has to arrange without any additional cost to GFGNL. Failure to this penalty will be deducted 10% of service cost per instance of each site.

g) For Site integration, payment will be given based on the rates mentioned in following table rate card mentioned in below **VIP/Adhoc/ Major** table.

h) At the end of event, dismantle of site will be in scope of bidder with immediate basis or as instructed by the event authorized agency or as informed from the GFGNL.

#	Description	UoM	Unit price (w/o Tax) (B)
1	**VIP/Ad-Hoc Events:** Establishment (SITC(Supply, Installation, Testing and Commissioning)) acceptance, Service(labour/transportation, etc.) and recovery(dismantle) Cost to maintain Temporary Connectivity during **VIP / Major/ Ad-Hoc Events** for **Wireline on Fibre**	Nu	14750
2	**VIP/Ad-Hoc Events:** Establishment SITC (Supply, Installation, Testing and Commissioning)) acceptance, Service(labour/transportation, etc.) and recovery(dismantle) Cost to maintain Temporary Connectivity during **VIP / Major/ Ad-Hoc Events** For Wireless **(upto 6 mtr)**	Nu	20060
3	**VIP/Ad-Hoc Events:** Establishment (SITC(Supply, Installation, Testing and Commissioning))acceptance, Service(labour/transportation, etc.) and recovery(dismantle) Cost to maintain Temporary Connectivity during **VIP / Major / Ad-Hoc Events** For Wireless **(above 6mtr)**	Nu	41300

Table-1 (Rate card of VIP/Major/Ad-Hoc Events)

5.20 EARTHING AT GP LOCATION

a) The PIA shall provide Chemical Earthing at newly connected GP and the existing connected GP(wherever applicable) and timely maintain during preventive and corrective maintenance at all the GP locations without any extra cost , as per specifications approved by GFGNL, with following details during entire contract duration:

I. Item : Chemical earthing as per RDSO specifications RDSO/SPN/197

II. Earthing Rod : Length 3.0 Meter (Minimum)
: Copper Coating 250 Microns (Minimum)
: Dia 17 mm
: Engraving UL mark/ Name of the Manufacturer/ Batch No.

III. Back Fill Material : Resistivity 0.2 Ohm mtr. (max)
: Packing in 10 Kg with Batch No. printed on Bag.

IV. Size of the Earth Pit : Top -- 285 MM

: Bottom -- 200 MM
: Height --190 MM

b) PIA shall supply all the accessories required like lugs, fuses (at the power plant end), cable tray, support iron structure, Power Cable, Earthing Cable, and Attenuators etc. Length of Power & Earthing Cable, Number of Attenuators are site specific, and PIA needs to supply as per site survey.
c) Earthing at GP for existing and newly created GP will be solely responsibility of selected bidder without any extra cost to GFGNL.

Note:1

PIA shall ensure compliance with the earthing requirements specified in the RFP at all applicable GP /Shelter locations during the entire contract period. Existing earthing infrastructure may be retained only if it meets the functional, safety, and performance requirements and is found compliant with the specifications prescribed in the RFP. Where the existing earthing arrangement is found defective or inadequate for meeting the prescribed requirements, the PIA shall undertake necessary augmentation/replacement at its own cost.

The cost of such compliance, including augmentation/reconstruction wherever required, shall be included in the scope of work and quoted rates, and no separate payment will be made by GFGNL.

Note:2

Existing earthing infrastructure at Phase-I and Phase-II sites found suitable earthing during joint verification shall be acceptable and shall not require replacement solely due to takeover. Any challanging in earthing systems identified and recorded during the joint handover process or in entire contract duration shall be responsibility of the successful PIA for replacement, upgrade, maintain compliant earthing infrastructure and meeting the applicable performance and safety requirements during the entire contract duration.

Note:3

The bidder shall ensure on a key objective of a minimum 6-hour power backup at each GP location. The bidder shall factor all required equipment, accessories, and ancillary items(including Supply Installation, testing and commissioning) in its financial bid. No additional payment beyond the discovered bid value shall be made, and the bidder shall be solely responsible for meeting the specified SLA and power backup requirement.

5.21 INSPECTION AND ACCEPTANCE TESTING

I. During the Project, GFGNL shall have the right to inspect, test and audit the network infrastructure and modalities across processes to construct, operate and maintain the network till Gram Panchayat (GP) during construction and operation period i.e. throughout \the

lifecycle of the project.

II. For determining that the Development Works and/or the Upgradation Works conform to the Agreement, the IE shall require the PIA to carry out or cause to be carried out tests, at such time and frequency and in such manner as may be specified by the IE from time to time in accordance with Good Industry Practice, Specifications and Standards, and Acceptance Testing Template for quality assurance.

III. These tests would include testing of all the installed active and passive electronics and passive infrastructure along with its additional items deployed under construction and upgradation of the network infrastructure as per the scope of work.

IV. This shall also include all network links along with testing of network traffic from the Block to Gram Panchayat (GP), SDC/NOC to Block, SDC/NOC to GP, GP to Village, SDC/NOC to village and further to NOC implemented / leveraged for this project and BharatNet Delhi and Bangalore NOC.

V. The PIA shall perform and facilitate the following with regards to testing activities:

A. Supply of products/material or network infrastructure:

I. During the Contract Period, the PIA shall obtain from Original Equipment Manufacturers (OEM), the relevant certificates or documents with relevant test results, certifying that the product / material supplied for the Project conforms to the Specifications and Standards and design requirements as per provisions set forth in Technical specification section.

II. The records of relevant certificates shall be maintained by the PIA throughout the Contract Period.Submit the same to GFGNL and the IE within 7 days of receipt of such certificates or documents from OEMs.

III. In case the product / material supplied for the Project does not conform to the Specifications and Standards or is deficient in terms of relevant certificates /documents / test results, as inspected by GFGNL or IE, then the costs to be incurred on any replacement of such product / material shall be borne solely by the PIA.

B. Deployment of products/ material or network infrastructure

i. The acceptance testing (AT) of the New Network and upgradation of Existing Network shall be carried out as per the Acceptance Testing Schedule issued by QA and GFGNL which can be accessed online from the website of QA and GFGNL. As validated by the IE, such tests along with Acceptance Testing Template shall be designed in conformance with the provisions set forth under the section of technical specification of OEM mentioned in this RFP, Specifications and Standards and Good Industry Practice.

ii. The fixed acceptance testing template (AT format) should be submit by PIA in consultation with the IE/GFGNL within first week of offered sub-block/GP to avoid any delay.

iii. Prior to Final Acceptance Testing (FAT), the PIA shall conduct end-to-end traffic testing from SNOC/NOC to Gram Panchayat (GP) and village endpoints to validate performance parameters including latency, jitter, packet loss, throughput, QoS, and failover, in accordance with OEM technical specifications, acceptance testing template, and good industry practice.

iv. The PIA shall, no later than 30 (thirty) days prior to the likely completion of the construction, notify the IE and GFGNL of its intent to subject the infrastructure to tests.
v. Further, no later than 10 (ten) days prior to the actual date of tests, the PIA shall furnish detailed inventory and particulars of all works and equipment forming part of the project to the IE and GFGNL.
vi. In the event of the PIA and the IE failing to mutually agree on the dates for conducting the tests, the PIA shall fix the dates by not less than 10 (ten) working days' notice to the IE, and in the event the IE delays the tests hereunder, GFGNL shall ensure that tests are completed in time either by the IE or any substitute thereof.
vii. The PIA shall progressively self-conduct and perform Preliminary Acceptance Testing(PAT) for network infrastructure being created as per the scope of work.
viii. All tests shall be conducted in accordance with Acceptance Testing Template duly approved by GFGNL at the cost and expense of the PIA. The IE shall undertake the tests only when all the Gram Panchayat (GP) offered for testing are visible in the NOC(GFGNL- NMS).
ix. Once the PIA performs the PAT, it shall offer network infrastructure within a Block subject to minimum 10% Gram Panchayat (GP) completed and pinged from the Central NOC or visible in SNOC, for testing purposes to the IE for Final Acceptance Test (FAT). Inspection work for FAT within a Block shall be offered only after completion of PAT of the route and site location by the PIA.
x. The schedule for such testing shall be based on a project plan and the timelines for the same shall be agreed between IE and PIA. However, in case of any changes in the schedule or plan, PIA shall notify the IE, 10 (ten) ~~working~~ calendar days prior to the scheduled date.
xi. In pursuance of the provisions of this Agreement, the IE shall conduct visual and physical check of the infrastructure at Blocks and Gram Panchayat (GP) and central locations (i.e. NOC) to determine that all works, equipment and services forming part thereof conform to the provision of this Agreement and the detailed scope of work as defined in this RFP.
xii. The IE shall perform tests of offered Gram Panchayat (GP) aggregated at Block level in accordance with Good Industry Practice, Specifications and Standards, and Acceptance Testing Template. Sample sites and its routes to be checked shall be decided by the IE.
xiii. The PIA shall facilitate the IE in conducting the tests as per approved Acceptance Testing Template and/or as per directions of the IE. All reasonable facilities and assistance like testing instruments and other test devices including access to drawings and other details shall be furnished, by the PIA to the IE and GFGNL.
xiv. The cost of all associated works regarding testing as per the scope of work such as digging pits at sample sites for connectivity across Gram Panchayat (GP), its restoration,and arrangement of testing instruments such as OTDR etc. shall be borne by the PIA.
xv. The IE may also decide to witness, or participate in, any of the tests to be undertaken by the PIA for its own quality assurance in accordance with Good Industry Practice,Specification and Standards, and in such an event, the PIA shall cooperate with, and provide the necessary assistance to, the IE for discharging its functions hereunder.
xvi. Result of IE's inspection and audit shall only be valid for Gram Panchayat (GP) which were offered for testing under a Block. If PIA offers a Block for inspection more than once, IE and GFGNL reserve the right to include or exclude the test of previously completed Gram

Panchayat (GP) as well.

xvii. The overall result(s) of the FAT conducted by IE/ GFGNL shall be indicated as "Satisfactory" or "Unsatisfactory" as judged at the time of inspection on merits of each case. The results of the test shall be jointly signed by the authorised personnel of the PIA and IE. In case of classifying the work as “Unsatisfactory”, the PIA shall highlight the reason for non-compliance as per the Specifications and Standards set forth under technical specifications of equipment sections and Good Industry Practice along with design requirements under the scope of work. The results of the FAT conducted shall include submission of all relevant documents such as measurement book, Acceptance Testing Template report etc.

xviii. Further, “Unsatisfactory” cases shall be communicated to the PIA by the IE/ GFGNL for its rectification.

xix. During a FAT, if more than 10% discrepancies across site route or locations across Gram Panchayats (GPs) are observed within a Block which may be attributed due to negligence on the part of the PIA, under such circumstances, the FAT may be rejected and retesting carried out at the PIA’s cost. Repeated failures shall trigger escalation, Second failure: Expanded sampling and witnessed testing by IE. Third failure: Full PAT re-certification, extended soak testing, and contractual remedies including LD and PBG invocation.Successful traffic testing is a condition precedent for FAT acceptance and milestone payments. Provisional Acceptance may be granted only if discrepancies are below 10% and GPs are visible in SNOC, with a jointly signed Punch List with IE.

xx. Further, the PIA shall get the work redone in a time bound manner and re-submit FAT report compliance, upon which IE/ GFGNL shall have to recheck the offered Gram Panchayat (GP) and may also extend the sample size of site route or locations across Gram Panchayats (GPs) for discrepancies and record its observations. However, if the discrepancies are less than 10% within a Block, then GFGNL on recommendation of IE shall provide a provisional acceptance and issue a Provisional Acceptance Certificate as per provision set forth in this Section.

xxi. However, the issuance of Provisional Acceptance Certificate shall be subjected to the visibility of Gram Panchayat (GP) in the State Network Operations Centre (SNOC). In such an event, the Provisional Acceptance Certificate shall have appended thereto a list of outstanding items signed jointly by the Independent Engineer and the PIA (the “Punch List”); provided that the Independent Engineer or GFGNL shall not withhold the Provisional Acceptance Certificate for reason of any work remaining incomplete if the delay in completion thereof is attributable to GFGNL.

xxii. The primary goal of Acceptance Testing is to ensure that the work (including all the components as discussed in the scope of work) meets requirements, standards, specifications, and performance, by ensuring that the following are associated with clear, quantifiable metrics for accountability:

- Infrastructure Compliance
- Performance
- Project Documentation

xxiii. The Successful bidder shall inform the department in writing, as and when the work is completed for a specific work order, with the request to conduct AT.

xxiv. AT shall be conducted route wise as well as for complete entire island routes.
xxv. GFGNL may associate authorized personnel for AT.
xxvi. The bidder shall co-ordinate and carry any other required test as desired by purchaser.
xxvii. The bidder shall bring all the testing equipment to site as required under the procedure to carry out testing at no extra cost. Bidder to submit calibration certificate of test equipment prior to AT.
xxviii. Any procedure delay for approval of AT acceptance by GFGNL, shall not be considered as delay on bidder's part.
xxix. The bidder is required to rectify the shortcomings reported, if any, during the testing. The selected bidder shall make the required changes at no extra cost.
xxx. The payment shall be released to the Bidder from the date of successful testing and acceptance of the respective route.
xxxi. The bidder shall be required to extend required cooperation including testing of Material/Links etc. for successful AT by GFGNL officials or appointed TPA/IE by GFGNL.
~~xxxii.~~ All the network elements & route shall be brought in the NMS with complete testing of FCAPS (Fault, configuration, accounting, performance and security) functionality. ~~Bidder has to ensure EMS integration with GFGNL NMS to be eligible for last milestone delivery & payment. Any delay from NMS side will not be attributed to Bidder.~~
xxxiii. Bidder has to update the link delivery and inventories in existing GFGNL GIS system and extend necessary support for GIS, ERP and NMS integration for its delivery as applicable.

C. Rectification of defects and deficiencies

I. The PIA is obligated to rectify the outstanding item or Punch List in a time bound manner to receive a Final Acceptance Certificate on the same as per provision set forth in the above section,i.e., *Deployment of products/ material or network infrastructure-xviii.*
II. In this process, the PIA shall comply with the timelines of the construction milestone and shall be responsible for delays on the re-work on its scope.
III. In case any inspected or tested components/site route fail to conform to the Specifications and Standards and design requirements as per provisions in the RFP, the PIA shall either replace the rejected components or make all alterations necessary to meet specification/ requirements, without any additional cost to GFGNL.
IV. If any equipment or any part thereof is found to be defective or fails to fulfil the requirements as per provisions set forth in this RFP, GFGNL shall give notice to the PIA setting forth details of such defects or failure and the PIA shall at their own cost make the defective equipment good or alter the same to make it comply with the requirements forthwith, within a period not exceeding one month of the initial report.These replacements shall be made by the PIA free of all charges at site and route locations.
V. Further, in the entire process the IE/ GFGNL shall make a report of inspections (the "Inspection Report") performed as a part of FAT. The Inspection Report shall state defects or deficiencies, if any, with reasonable details and reference to the specifications and Standards and design requirements as per provisions set forth in this RFP.

VI. IE shall send a copy of the Inspection Report to GFGNL and the PIA within(seven) days of such inspection and upon receipt thereof, the PIA shall rectify and remedy the defects or deficiencies, if any, stated in the Inspection Report.

VII. Notwithstanding the foregoing, such inspection or submission of Inspection Report by the IE shall not relieve or absolve the PIA of its obligations and liabilities hereunder in any manner whatsoever.

VIII. Based on the Inspection report or the defect and deficiencies observed in the Project,the IE/ GFGNL shall verify whether remedial measures have brought the Development Works and/or the Upgradation Works into compliance with Specifications and Standards and design requirements as per provisions set forth in this RFP.

IX. The procedure for closure of defect and deficiencies as reported shall be repeated until such development Works and/or the Upgradation Works conform to the Specifications and Standards and design requirements as per provisions set forth in this RFP.

X. Further, it is agreed that the tests pursuant to this shall also be undertaken in addition to and independent of the tests carried out by the PIA for its own quality assurance in accordance with Applicable Laws, Applicable Permits and Good Industry Practice.

XI. It is also agreed that a copy of the results of such tests shall be sent by the PIA to the IE forthwith. The costs to be incurred on any test which is undertaken for determining the rectification of any defect or deficiency in the Development Works and/or the Upgradation Works shall be borne solely by the PIA.

XII. Upon successful completion of tests, the IE/ GFGNL shall issue the Completion Certificate,as the case may be, in accordance with the provisions in this i.e., *Deployment of products/ material or network infrastructure-xviii.*

XIII. If the IE/ GFGNL certifies to GFGNL and the PIA that it is unable to issue the Completion Certificate or Provisional Acceptance Certificate, as the case may be, because of events or circumstances on account of which the tests could not be held or had to be suspended,the PIA shall be entitled to re-schedule the tests and hold the same as soon as reasonably practicable.

XIV. In pursuance to clause above, the Completion Certificates/ A.T. Certificates will be issued ‘site wise’ in case of Acceptance testing of equipment and ‘Ring wise’ for Network commissioning.

The Acceptance Testing (AT) Template, test parameters, and acceptance criteria shall be finalized in consultation with the GFGNL/IE as per the RFP terms and conditions before commencement of large-scale acceptance activities. Once finalized and approved, acceptance testing shall be carried out based on the approved criteria. Any subsequent changes, if required, shall be mutually agreed and communicated by GFGNL.

Acceptance Testing and re-testing shall be carried out in accordance with the RFP terms and conditions and approved AT procedures. Where re-testing or delays are attributable solely to non-availability of IE/GFGNL resources, GFGNL-side integration issues, or changes in approved test parameters after submission of the works for acceptance, the same shall not be treated as a delay

attributable to the PIA. Appropriate relief, including extension of timelines and exclusion from related penalties, may be considered by GFGNL on a case-to-case basis, subject to verification and supporting records. Payment shall be governed by successful acceptance of the works as per the provisions of the RFP terms and conditions.

5.22 RIGHT OF WAY

a. The Right of Way for the Project shall be granted as per the existing agreement with the State Government and supported by GFGNL through introduction letters for creation and upgradation of New Network and Existing Network respectively during the whole ~~contract~~ construction/project Period. During the Operation & Maintenance, the PIA shall also be facilitated RoW by GFGNL, only for replacement and repair of existing fiber deployed to maintain the new and existing network if required.

b. Based on network survey and design, or any other activities it may deem necessary, the PIA is permitted to apply and obtain the Right of Way for the Project from the State Government and other related agencies from the Appointed Date.

c. PIA shall obtain necessary Right of Way (RoW) from State/Central agencies whichever applicable by completely following RoW application process of respective agencies. State/SIA shall support the PIA in obtaining the same.GFGNL will pay for the ROW charges. In event of speeding of the work where ROW charges are minor, if PIA pays for the ROW charges, then GFGNL shall reimburse without delay (Monthly basis) after adjusting penalty raised/settled by the agency. The any associated penalty is to be settled or to be borne by the PIA. The after completion of the work / ROW obligation, it is the duty of PIA to timely collect the ROW charges / Security deposits with utmost seriousness. In case, the collection cycle exceeds beyond 6 (six) months without any reason in writing by the PIA, then GFGNL shall deduct the delayed amount from running payments without any sympathy.

d. The PIA shall not be required to pay Right of Way access charges for the Project during the Contract Period to the State Government (s) or its agencies. Further, any other costs associated with the Right of Way which are beyond the scope of the agreement between the State Government and DoT/ DBN / GFGNL shall be reimbursed by GFGNL, subject to submission of valid proof of payment by the PIA. This includes applicable charges for Right of Way from Government Instrumentalities regulating forest land, railway lines, defence areas, highways, oil and gas pipelines or any other agencies or departments.

e. Further, it is being expressly agreed and understood that DoT/ DBN / GFGNL or the State Government shall have no liability whatsoever in respect of survey carried out or work undertaken by the PIA on or about the Site (Route) of the New Network and Existing Network pursuant hereto in the event of Termination or otherwise.

f. The bidder is responsible for obtaining RoW permissions. The office of GFGNL will facilitate with admin support if required and wherever possible in coordination with respective Government agencies, however, the PIA will be solely responsible to prepare proposals in requisite format, submit it to relevant agencies/ companies/ authorities for approval, and do necessarily follow up-meetings. In case, there are penalties for executing work without ROW permission, then PIA

shall bear that. State government has waived ROW charges. However, approval for alignment with state agencies still needs to be done. PIA shall obtain ROW permissions from the central and state agencies such as national highways, Oil and gas pipelines, Railways etc. The PIA has to pay ROW charges to any agencies (Except Penalties for violation which PIA has to bear), then the GFGNL shall reimburse within 30 days on receipt of complete and relevant documents.

g. GFGNL shall relax the penalties on delay due to ROW permissions with proper justification. No penalty shall be levied due to delay in RoW due to any reason whatsoever if the same is not solely attributable to the PIA .

h. Reinstatement charges based on the standard SOR rates of the District/ State authorities, if any, shall be payable by GFGNL either to the respective authority or shall be reimbursed to the PIA, if paid by the PIA after the same is approved by GFGNL. However, the delay on account of delayed payment/ non-payment of such reinstatement charges shall be on account of the PIA and no LD waiver for such delay shall be granted.

i. It is expressly agreed that the license granted hereunder with respect to Right of Way for the Project shall terminate automatically and forthwith, without the need for any action to be taken by GFGNL to terminate the license, upon the Termination of this Agreement for any reason whatsoever.

j. It is hereby clarified that the provisions of this Clause shall apply mutatis mutandis for any additional Right of Way that may be required for the Project in accordance with the provisions of this Agreement, and upon procurement thereof, such Right of Way shall form part of the Project, as the case may be.

Note :- Installation of poles shall be at public land only.

k. Selected bidder has to support through Project Management Tool including Workflow management, RoW Management and integrated with GIS, i.e. the web portal / project management should be ready with RoW tracking details and made live update on day0.

l. The PIA has to provide minimum ~~2~~ 1 member's(at district level) team for ROW applications and follow-ups and a dedicated 1 (one) ROW lead to act as a SPOC for GFGNL ROW process.All RoW team members has to understand the local geography and communicate fluently into local language to concern authority. For District and block level RoW related all communications/follow-ups shall be taken care by the district and block field level resources. For the resources, RoW Coordinator: Graduate in any discipline with a minimum of 5 years of experience in RoW management, liaisoning, utility/infrastructure projects, telecom, OFC, or similar sector projects. RoW Personnel: Diploma/Graduate in any discipline with a minimum of 2 years of experience in field coordination, RoW facilitation, utility projects, telecom/OFC deployment, or related activities shall be preferable.

m. As there is no Single Window clearance for RoW. GFGNL may intimated the state bodies of the RoW requirements of this project. Central agencies shall be intimated by GFGNL in due course. The PIA shall provide a separate dedicated RoW team for filing, liaising, followup and escalation of RoW permission related matters. However, tentative timeline mentioned below will be applicable to selected bidder in case of any of the authority/ department excluded from the above intimation. Failure to this will create a base ground to invite the penalty to bidder above the cap

limit of CAPEX and OPEX. Penalty will be calculated by deducting 5% Capex of number of GP's covered in planned route per missed milestone mentioned below in table. However, exclusion can be given with reference to submission of valid documentations from authorized agency of RoW .

#	Parameters	Measurement Criteria
1	Appoint Nodal Officer	Successful bidder shall notify to GFGNL over e-mail/letter and on the government portal the officer (by designation) who shall be the nodal point for the purposes of RoW, within thirty calendar days from the date of assigned workorder. Any replacement of such officer shall also be promptly notified on the government portal as well as to the GFGNL.
2	Survey and Submission of RoW application to concern authority	Survey Report and Submission of received Office Copy(OC) of applied RoW of that route from authority. (*bidder has option to submit the primary route and ready with mitigation plan with alternate route or any other stragey applicable/feasible on field to avoid delay in approval of primary route ROW application rejection)*
3	Acknowledgement of RoW applications (DN of Applications) from concern authority	DN Number/ approved Application Number/ receipt/ other proper evidence of applications submission documents as specified under sub-rule (2) and in such form and manner as may be specified by that entity. (*a copy of the authorisation granted by the Central Government/State Government, details of the underground telecommunication network proposed to be laid) Bidder has to ready and submit the primary route and ready with mitigation plan with alternate route or any other stragey applicable/feasible on field to avoid delay in approval*

Table-0A

Where, T0 is the date of workorder assigned to the selected PIA.

n. It is the sole responsibility of PIA to ensure compliance with RoW procedures as per the concerned authority's regulations. The authority may take between 6-8 months to complete the requisite procedures, and PIA must comply with the RoW procedure to be eligible for claiming the milestone (3/4) payment criteria. PIA must strictly adhere to the RoW procedure, and any non-compliances or actions from the authority due to PIA negligence will be PIA's sole responsibility. In the event of failure to comply with the RoW procedure, GFGNL's decision will be final and binding on PIA.

o. The PIA shall, at its own expense, apply for and obtain the Right of Way for the Project which shall include making and filing applications, paying associated costs related to RoW approval, liaising with Government Instrumentalities and agencies etc. for which PIA may engage suitable consultants. The PIA shall pay the ROW charges to be paid to the ROW agencies, if the same is upto Rs 50,000/-. The PIA shall claim the reimbursement of the same from GFGNL. If the

amount is more than Rs 50,000, PIA shall have the option either to pay to the ROW agency and seek reimbursement from GFGNL along with normal bills or ask GFGNL to pay directly to the ROW agency. The similar arrangement shall be applicable during the whole contract period for O&M also.The bill should be in the name of tendering authority.

p. Further, it is being expressly agreed and understood that State Government/DST/GoG/DoT/ DIGITAL BHARAT NIDHI(DBN)/ GoI/ GFGNL or the State Government shall have no liability whatsoever in respect of survey carried out or work undertaken by the PIA on or about the Site (Route) of the New Network and Existing Network pursuant hereto in the event of Termination or otherwise.

q. GFGNL competent authority shall relax the penalties on delay due to ROW permissions with proper justification and valid evidence. No penalty shall be levied due to delay in RoW due to any reason whatsoever if the same is not solely attributable to the PIA.

r. Reinstatement charges based on the standard SOR rates of the District/ State authorities, if any, shall be payable by GFGNL either to the respective authority or shall be reimbursed to the PIA, if paid by the PIA after the same is approved by GFGNL. However, the delay on account of delayed payment/ non-payment of such reinstatement charges shall be on account of the PIA and no LD waiver for such delay shall be granted.

s. It is expressly agreed that the license granted hereunder with respect to Right of Way for the Project shall terminate automatically and forthwith, without the need for any action to be taken by GFGNL to terminate the license, upon the Termination of this Agreement for any reason whatsoever.

t. It is hereby clarified that the provisions of this Clause shall apply mutatis mutandis for any additional Right of Way that may be required for the Project in accordance with the provisions of this Agreement, and upon procurement thereof, such Right of Way shall form part of the Project, as the case may be.

u. It will be the bidder's responsibility to release the full amount of any refundable deposits or Bank Guarantees (BGs) to GFGNL before the transition to the full O&M contract period. However, in justifiable cases up to the satisfaction level of GFGNL, exemptions may be granted based on the submission of requisite valid documents and PIA's undertaking. In such cases, the same withheld amount will be deducted from the PIA's payable till the full amount is released by the authority. Any full/partial deductions made by the authority will be recovered from the PIA's payable or PBG."

   Note: Installation of pole shall be in public land only with consideration of carring proper weight/heavier load for public safety.

v. Before start of the trenching work, extent of having limestone powder making and follow this marking strictly.

w. For the cases of challenges with existing RoW authority, change of authority (i.e. state to NH/NE, forest territory etc), revised RoW guideline etc. during delay in conclusive process of ROW, PIA shall be responsible for re-initiating/re-applying RoW application for the compliance without any additional cost to GFGNL.

x. If PIA has completed OFC laying work & fails to get the required RoW permission due to his/her negligence, no follow-ups with RoW authority, query resolution pending given by RoW authorities time to time during entire RoW process, then penalty of Rs. 50/meter will be applicable for failing in getting the RoW permission on affected route length. If such is the case for any SH/NH/Railway/Major Canal/O&G crossing, then penalty of Rs. 50,000 per crossing is applicable to PIA over and above actual penalty levied by the ROW agency. This penalty will be over and above maximum penalty cap limit.

y. GFGNL is paying ROW associated refunds on request of PIA. Therefore, it is the duty of PIA to get refund of RoW Security Deposit or Bank Guarantee within outer limit of 6 months of completion of the work associated with corresponding of ROW. In consequence of failing upon by the PIA, GFGNL may withhold/recover amount from payables to PIA. Any deduction by RoW agency from refundable amount shall be recovered from PIA payables.

All field related challenges shall be resolve by the PIA without any delay on project timeline. However, For the ROW and any other critical challanges shall be addressed by GFGNL on a case-to-case basis subject to submission of valid documentary evidence and verification by the IE/GFGNL.

5.23 OPERATION AND MAINTENANCE

The breakdown of the contract for maintaining a network after its set up.

I. As mentioned in the Factsheet, above, the overall/complete contract duration, including Supply, Installation, Testing, Commissioning, and Maintenance, will last for 10 years.

II. Until the entire network is running, any parts that are active will also be maintained, and payment for this will be determined on a proportional basis.

III. PIA shall undertake the responsibility for Operations & Maintenance (O&M) of the Existing Network including the existing leased OFC of Phase-1 (all the fibres in the cable, although only one fibre is used in many cases) & in phase-2 till the same is replaced with the new laid network,Incremental OFC laid under BharatNet, Maintenance of existing GPON equipment (OLTs, ONTs, all active and passive elements including Solar system) and New deployed Network under this RFP will be in the scope of selected bidder.

IV. All expenditure required to perform O&M of the Existing Network and New Network shall be the responsibility of the PIA.

V. The PIA shall be required to commence O&M for newly connected individual Gram Panchayats (GPs) immediately after the date of commissioning and from the date of handover in case of existing BharatNet network.

VI. Beyond 10th year(For contract extension), the equipment which is not EoSL (End of Support/Sales Life), can be continued along with the network for O&M as per decision of DIGITAL BHARAT NIDHI(DBN)/ DoT/ GFGNL and also with the consensus of PIA. The OPEX payable after 10th year will be enhanced annually by 4% (i.e. 11th year will have OPEX of 6.76%, 12th year will be 7.02% and so on) till the continuity of the O&M of the network by PIA.

VII. Government of INDIA has launched CBuD (Call Before You Dig) for synegrgies between

various stakeholders. PIA shall ensure to use CBuD application by his appointed agencies/vendors/employees prior to any field work commencement. Selected PIA shall mandatorily ensure to use CBuD applications, rules and compliances by his appointed agencies/vendors/employees/subcontractors prior to any field work commencement. Penalties will be applied in case of non-compliance as per CBuD.

VIII. A block network will only be considered active (100% go-live) when all 90% of GPs will be operational on MPLS network at last mile.Where, Block to be consider as ~2 or 3 Sub-Block based on geographical boundaries and connected through dual homed OFC network which are to be parented on Master-block,subsequencially the all the GPs of Block as per network design principles mentioned above connected in various dual home OFC ring architecture. Accordingly, 90% of all GPs of Block are live in IP-MPLS OFC dual home ring architecture visible in SNOC/CNOC will be treated as 100% go-live. Further, the aggregate count of GP at Sub-Block will be considered at once for the cases of dual home network architecture,i.e., the other side of block GP ring will not be considered.

IX. Selected PIA shall undertake the responsibility for Operations & Maintenance (O&M) of the all active and passive elements fall under following categories,

a) Phase-I entire existing infrastructure till the same is replaced with new laid network.
b) Phase-II Existing Network infrastructure including the shelter infrastructure(Which includes stabilizers, racks, and GPON network elements with all releated active and passive accessories, splitters, FDMS etc.)immediately after the milestone mentioned in the RFP document of Handover-Takeover (HoTo) procedure.
c) Phase-I infrastructure immediately after completion of own infrastructure of leased sections as per milestone.
~~d)~~ Intermediate/incremental sections (Connectivity between Phase-I and Phase-II, between intermediate island connectivity, ring shortening, etc.) and any other additional scope mentioned in this RFP with design approval of IE/GFGNL.
e) Connecting/Shifting the remaining unconnected Gram Panchayats (GPs) under BharatNet Operation and Maintenance (O&M) of the existing as well as the newly deployed network, including proactive and reactive maintenance activities.
f) The establishment of governance framework, and escalation procedures & matrix for network and customer support service on 365 x 24 x 7 basis.
g) PIA shall support on extending access of the Network Management System or other equivalent systems along with network performance reports on a mutually agreed basis to GFGNL, CNOC-BharatNet Delhi,and Bangalore NOC.
h) The services provided shall adhere and conform to applicable security policies and guidelines issued by DoT/TRAI/GoI/GoG/MeitY/GFGNL - DST.
i) The PIA shall be responsible and bear costs for replenishment and upgrade of all active and passive infrastructure including all ancillaries required for smooth executions and operations & maintenance of project across the Contract Period.
j) In case of any defect, deficiency or deterioration in the Project poses a hazard to safety or risk of damage to property, the PIA shall promptly take all reasonable measures for eliminating or minimising such danger.
k) The PIA shall insure all the equipment at GP for theft, damages due to fire,

flood,earthquake, storm etc for the entire project duration.

l) The basic Operation and Maintenance Guidelines/ directions released centrally through BSNL (RFP Number: *MM/BNO&M/BN-III/T-791/2024 or MM/BNO&M/BN-III/T-857/2025 or latest*) to be follow including their corrigendum's/addenda / clarification notes. The guidelines released through this RFP document will be supersedes to it.

X. The O&M performance will be measured out as per the SLA provided. The PIA shall be required to start O&M for newly connected individual Gram Panchayats (GPs) immediately after the date of commissioning and from the date of handover in case of existing BharatNet network.

XI. Selected PIA will be solely responsible for following things but not limited to during their O&M phase,

a) Infrastructure

b) Network Inventory

c) Network Configuration/ Configuration Management

d) Network and Service provisioning

e) Server provisioning

f) User provisioning

g) Fault Restoration Service

h) Methodology for Fibre Restoration /Fibre Cuts

i) Periodic Maintenance

j) Other Network O&M Parameters

k) Geo fencing based attendance management system.

l) Capacity Augmentation

The PIA shall be responsible for the operations of the network entailing the following:

5.23.1 INFRASTRUCTURE

a) PIA shall undertake the responsibility for Operations & Maintenance (O&M) of the Existing Network including the GFGNL laid in BharatNet Phase-I & II including the existing leased OFC in Ph-I till the same is replaced with the new laid network, incremental OFC laid under BharatNet & also of both Phase-I & II networks GPON equipment (OLTs, ONTs), RFMS, and Solar Photo Voltaic Systems at the GPs, all active and passive elements like but not limited to fibre, duct, joint indicators, (single & three phase)Stabilizers, UPS at GP end, etc., Old infrastructure created under Bharatnet Phase-II including all GPON equipments and utilitity and New Network delivered against scope mentioned in this RFP.

b) PIA shall extend support on access of the Network Management System or other equivalent systems along with network performance reports on a mutually agreed basis to BharatNet Delhi

and Bangalore NOC.

c) GFGNL has already installed Copper/electric SFP at Shelter, L2 switches at GP in BharatNet Phase-II network, selected PIA will be solely responsible to recover and migrate on suitable locations with an approval from the GFGNL. Selected PIA will be responsible to maintain the inventory and share to GFGNL as and when asked. GFGNL has the rights to utilize this inventory for any other project also if required, selected bidder will be responsible to get the AMC for those inventories for entire contract duration.

d) In case of any defect, deficiency or deterioration in the Project poses a hazard to safety or risk of damage to property, the PIA shall promptly take all reasonable measures for eliminating or minimizing such danger.

e) Bidder has to ensure to follow the all governance law for GoI/Government of Gujarat network security, the port level security, mac binding, firewall with defining secure connectivity including but not limited to all active network elements as well as for services.

f) Bidder is responsible if any case change in NMS / EMS position/shifting of infrastructure, or changing the capacity, licenses, etc.

g) Prevent third party damages viz. theft or damage/s caused by other underground utility service provider.

h) Submission of Asbuilt, network layout change, observations need to update in GIS.

i) For any kind of sabotage in the network, primary PIA will be solely responsible.

j) For all types of resources/material Spare arrangement, Hardware management, RnR (Remove/Repair and Replace) management, courier charges will be in the scope of new bidders.

k) At the end of each toll gate of Handover takeover(HoTo) process both the parties (ole and new PIA) will have to submit the signoff report to GFGNL Central Office-Gandhinagar with all evidence.

l) **Existing Infrastructure**: Site of the Existing Network shall include an inventory of existing network infrastructure across Blocks, Gram Panchayats (GPs) and Villages along with laid OFC infrastructure. The indicative information is described in 9.38 (Annexure XXXIX) for Bharatnet Phase-I & II.

m) Maintaining the network architecture and all its components, including fiber optic cables, switches, routers, and other equipment, including the number of nodes, connections, and transmission speeds will be in the scope of selected bidder. The security and safety of network including active and passive network elements (H/w and Software) shall be core responsibility of the bidder.

n) Responsibility of selected PIA (Bharatnet Phase III)

1) Front line maintenance

2) Routine and preventive maintenance based on OEM instructions

3) on site replacement support (spares to be provided by OEM),

4) Operation and Management and service provisioning ~~through GFGNL tools~~

q) Responsibility of Other selected agency on boarded by the GFGNL and handover for O&M to selected PIA

1) Providing OEM's Warranty / AMC till end of contract of 10 years

2) Providing spares towards repair and replacement of faulty parts within the SLA

3) Warranty of spare parts

4) Remote assistance support

5) OEM's L3 support

6) Battery replacement for UPS/SMPS etc. at shelter.

7) other.

r) Responsibility of GFGNL

i. Payments against Operation and Management and service provisioning: For any above additional infra O&M, GFGNL will pay 2% of field equipment cost per annum of discovered charges of tender, 1% of centralized equipment cost(installed at SDC) as O&M Charges for managing the SLAs through AMC cover and spares without adding any delay at the end of PIA. The delay at the end of AMC provider will not be counted in the fault bucket of PIA. The above payment will be over and above quoted O&M with prior approval and agreement.

s) The PIA shall be solely responsible for ensuring network uptime and performance along with providing comprehensive support during the entire Contract Period for the network created/upgraded till village level/last mile created / infrastructure developed through this RFP.

r) This shall also include the establishment of governance framework, and escalation procedures & matrix for network and customer support service on 365 x 24 x 7 basis during the entire contract duration.

s) As part of the maintenance, PIA shall be required to maintain the upkeep of the medium of connectivity, restoration of services, any other maintenance job required to meet the redundancy and SLAs.

t) For the infra created by the GFGNL authorized third party agency, In the event of outage/Network threat due to delayed O&M from the selected PIA's of ABP BharatNet Phase -III, applicable SLA penalties will be imposed for the delay caused.Furthermore, In the case of Shelter (created by the third party agency and handed over to selected PIA of ABP BharatNet Phase-III for O&M) ,Infra fault troubleshooting and solution, with the support of the shelter SPOC and OEM, shall be within the scope of the selected PIA of ABP BharatNet Phase-III. Basic electrical faults like but not limited to MCB,ELCB issues, loose wiring connections, replacement of burnt wires/connectors/MCBs, external environment alarms/configuration in the controller, or shifting of rectifier modules from faulty slot to healthy slot, etc., shall be resolved by the selected PIA without delay to avoid network threats or outages. Accordingly, PIA has to ensure qualified manpower for shelter infrastructure.Selected PIA need to perform Preventive Maintenance of Shelters and its related

active and passive all equipment (like but not limited to, SMPS, Battery Bank, Air conditioner, Earthing, Other accessories (LA, ACDB, smoke detectors, etc) and submit the PM reports as per mutually decided format with GFGNL on monthly basis to GFGNL. Selected PIA will be responsible to keep the related skill set manpower/resources to manage the end to end SLA including the utility / power infrastructure without any additional cost to tenderer.

5.23.1.1 INFRASTRUCTURE HANDOVER TAKEOVER

a. For Phase-I

I. The selected bidder is responsible for following, but not limited to, activities for the of the overall Amended BharatNet Program(ABP – BharatNet Ph-III) success including existing infrastructure handover takeover process.

Milestone	Activities
Initial Survey	Conduct a comprehensive survey of the existing infrastructure to assess its current state, identify potential issues like but not limited to Optical fibre losses through LSPM/OTDR report, identifications of Aerial OFC sections, and establish a baseline for future improvements if any in details. Submission of field survey input on this will be part of measurement (Minimum Sample field survey input mentioned in **Table-0B**, However, additional details may be considered)
Handover Takeover Process	Official transfer of responsibilities, including documents and necessary resources, from the existing PIA based on the milestones mentioned in details in section 5.13.3
Assessment of Infrastructure	Detailed evaluation of the existing infrastructure for capacity, performance, and necessary upgrades
Planning and Redesign	Where necessary, propose changes or enhancements to the infrastructure based on the needs (vision plan of the GFGNL) of the project and the assessment's outcomes
Implementation	Carry out the planned changes, which may include construction, installation of new equipment, implementation of new systems, etc.
Training	Train the tenderer/ end users on how to use and manage the updated relevant infrastructure, offer necessary support materials wherever applicable
Ongoing Maintenance and Support	Regular monitoring and maintenance of the existing infrastructure, resolution of issues, and performance assessment to ensure continuous service quality and submission of MIS reports.

Table-0A(Applicable for Phase-I & II)

II. The Network shall be made over Block wise with the GPs whose optical power is -25 dB or better at the GP end ONT. The same shall be ensured by the BSNL PIA of BharatNet Phase-I. The details of the equipment i.e. ONT,Solar, CCU, Battery (with replacement Date), Solar Panel, Enclosure, Earthing, and Splitter etc. will also be provided to the selected bidder.

III. Wherever feasible, The PIA shall be given access to NMS, GIS, so as to see the status and seek clarification, mention any observation in the HOTO Format.

IV. The PIA shall get the fiber health report from M/s BSNL-PIA as per the HOTO format. Restoration of fiber shall be done on mutual understanding among GFGNL, M/s BSNL and PIA.

a) **BHQ & POI End Equipment:**

I. Wherever feasible, The OLT along with make model, configuration, cards and PON diagram shall be made over by M/s BSNL /GFGNL to the PIA. However, PIA will be solely responsible to collect, analyze, correct and submit HLD and LLD of network. The PIA shall be responsible for maintenance of the same till the network is transferred to the MPLS router.

II. After transfer of network to the new equipment, the PIA shall make over the OLT to GFGNL.

b) **OFC Network:**

I. The OFC network corresponding to the GPs whose optical power is OK (-25 dB or better) and made over to the PIA by the ongoing agencies shall be transferred to the selected PIA for O&M on as is where is basis. The complete High level diagram(HLD), Low level diagram (LLD), KML file, asbuilt mentioning the routes shall be signed by the existing agency,selected PIA and GFGNL. Details of temporary restoration etc. shall also be marked. The PIA, if required, can mention its observations in the HOTO Format.

II. In the case of non-support from the Phase-I existing PIA, Selected PIA will be solely responsible to collect, analyze, correct and submit HLD and LLD of network based on the milestone designed in this RFP section 5.13.3.1 (A1) with submission of ABD(as-built drawings), digial ITP Sheet, LSPM and OTDR report with time stamp including the survey input mentioned in Table-0. with all valid documentations

							GP to BSNL POI Route					BSNL POI to BHQ Route							
Ph-I	District	Blocks Name	Name Of GPs	LGD Code Of GP	OFC Route Name	BSNL POI Name	Link loss(Tx/Rx)	Route Length(Km)	Rectification Required if any (Km)	Aerial(Km)	UG(Km)	Link loss (Tx/Rx)	Route Length(Km)	Rectification Required if any (Km)	Aerial(Km)	UG(Km)	Remarks If any	Total GPs (Connected on OFC)	Total OFC laid (Kms)

Table-0B

III. GFGNL or its authorized agency has the rights to attend sample base field visit to check the accuracy of the input. Deviations on the input which will impact on quality and financial will be treated very strictly and authorized to GFGNL to apply penalty of against liquidity damage clause or penalty of twice of overall cost proposed on those section.

IV. The responsibility of attending the faults in the damaged OFC routes is with the ongoing agency as per the milestone defined in section till the completion of handover takeover or exit of ongoing agency as per contract whichever is earlier.The existing agency shall progressively make over such GPs whose optical power is made available (-25dB) to the PIA with details of the routes

marked on the asbuilt (already available with the PIA). The equipment of such GPs shall be made over by the ongoing agency.

V. However, in cases, where, from the Date of first GP make over to the PIA, the existing PIA fails to make over some GPs within given milestones, the new PIA shall be bound to take over such GPs also. The PIA shall get the restoration charges as per the rates discovered in the existing As per Annexure-F. This RFP financial bid rate card.

~~VI.~~ Any section which is in damaged condition or temporarily restored shall be clearly mentioned in the HOTO memo. For permanent restoration of such damaged sections/temporary restored sections within defined limit as mentioned in section related to **"Repair-Reconstruct-Rectify-Replace",** the PIA shall be paid as per the predefined rates as per Annexure-F.

VII. The replacement of damaged sections can be any section from Sub Block to GP. PIA shall be responsible for end-to-end network including all the network elements(both for active and passive) both at Sub Block and GP level, till the network is transferred to the MPLS router.

b) For Phase-II

I. The selected agency will be responsible to complete the transfer of Knowledge & Handing/Taking over activity from existing agency within timeframe mentioned in related section.

II. The selected bidder is responsible for activities during the existing infrastructure handover takeover process of Bhartnet Phase-II network also as mentioned above in related section

III. **For the OFC network** the clauses mentioned above in related section will also be applicable. However, the survey input required in Table-0C with all valid documentations needs to submit from the onboarded PIA.

						GP to Block Route (ONT to OLT)					OLT to OLT Route / OLT (co-lo DWDM node to SDC Gandhinagar)								
District	Blocks(OLT) Name/ID	Name Of GPs	LGD Code Of GP	OFC Route Name	OLT Name	Link loss(Tx)	Route Length(Km)	Rectification Required if any (Km)	Aerial(Km)	UG (Km)	Block Name/ID	Link loss(Tx/Rx)	Route Length(Km)	Rectification Required if any (Km)	Aerial(Km)	UG (Km)	Remarks If any	Total GPs (Connected on OFC)	Total OFC laid (Kms)

Table-0C

IV. After successful completion of Handover Takeover(HoTo) process, all supporting documents will be handed over to GFGNL officials through online and offline.

5.23.2 HAND-OVER/TAKE-OVER EXISTING OPERATION(APPLICABLE FOR PHASE-I & PHASE-II NETWORK)

a) Selected Agency will be responsible to provide confirmation about successful Handover/ Take over operations from existing agency at the end of milestone defined in section till the completion of handover takeover or exit of ongoing agency as per contract whichever is earlier. The selected agency shall depute the required resources as per the requirements of tender document for carrying out the operations activity.

b) Selected bidder is required to issue Completion certification for completion of this HoTo process. Existing Agency will provide necessary handholding and transition support to new PIA- selected through this RFP wherever applicable. However, it will be sole responsibility of the selected bidder to coordinate end to end with the existing agencies and all relevant stakeholders involved in existing project.

c) Handover process will start Block wise, based on approval of tenderer. However, Based on the geographical condition or network requirement it may be initiate by Block Wise, lot wise, Route wise/GP Wise,district wise and GFGNL will further release the Guideline/SOP once the selected PIA will get onboarded.

d) Successful Bidder must align FRT resources with attendance within 12 weeks and in any case, if not able to arrange resources, penalty will be applicable as per RFP.

e) Handover/take-over will be conducted on toll-gate basis only.

Toll Gate based approach shall be implemented over period of 180 days for BharatNet Phase-I and 90 days for BharatNet Phase-II (considering the overall dependency and strengthen the project) in 3 different phases:

Phase 1: The existing PIA will run the operation and Maintenance and the new PIA will get the knowledge transfer.

Phase 2: The new PIA will run the operation and Maintenance under the supervision of the existing PIA.

Phase 3: Both the party will do the handholding work, documentation and sign-off the satisfactory transfer of work.

- New Agency/PIA shall be responsible to deploy sufficient manpower for network handover activity and do the signoff as per Project & RFP Guideline and both parties (OLD and New Agency) sign off report to be submitted at GFGNL Office.

f) The PIA shall be responsible for O&M of the taken over OFC network as well as eqipments installed/ infrastructure developed against BharatNet Ph-I till GP end like existing and newly developed OFC route to GP, GPON, dark fibres, replacement of faulty resources(materials)(both active and passive), power resources UPS, Solar panels, spare management including the managing the spare materials.

~~g) It is the responsibility of GFGNL to provide the shelter on time. It is the responsibility of PIA for timely survey, conveying the location of shelter at Sub-block location as part of overall fiberization plan.~~

h) ~~On best effort basis, GFGNL will provide shelter or in case of any difficulty or unforeseen delay in providing the shelter, then GFGNL will provide alternate location. To de-risk the PIA, it is clarified that the chance of shifting cases are very unlikely and over and above that even if the need of shifting is the necessity, then one time charges of following shall be applicable for payment by GFGNL to PIA to meet expenses upon intimation and approval.~~

For the cases of Shelter Shifting,

i) Shifting of electronics and accessories including, de-commissioning, de-installation, re-installation and commissioning = ~~Maximum up to Rs. 15,000/- per location.~~shall be paid as per the financial bid line item discovery through this RFP.

ii) ~~Rs. 400 per mtr for additional UG fiber work as per engineering instructions mentioned in RFP including material, workmanship and all the associated cost.~~ Remaining charges of UG OFC shall be paid based on financial discovery rate through this bidding process and shall be execute with OFC EI(Engineering Instruction) mentioned in the RFP.

Note- Above charges are excluding taxes.

i) It is the responsibility of PIA to complete the shifting within 10 calendar days from intimation date. It is the responsibility of PIA to plan shifting properly without disruption of any downtime of services **(zero service downtime)**. If the PIA fails to complete the Shifting Event within the prescribed timeline for reasons not constituting Force Majeure and not caused by GFGNL, LD of **INR 5,000 (Rupees Five Thousand) per day of delay**, capped at **INR 50,000 (Rupees Fifty Thousand) per Shifting Event**, shall apply. In the event of any service outage attributable to the PIA during a Shifting Event, the PIA shall be liable to pay LD of **INR 10,000 (Rupees Ten Thousand) per hour of outage, pro-rated for part thereof**. LDs under this clause are **exclusive remedies** for delay and downtime but are **without prejudice** to GFGNL's right to recover actual demonstrable losses where legally permissible.

j) BharatNet Ph-II till GP end like SDC - backhaul equipments, GPON, dark fibres, shelter including logistics, replacement of faulty resources/material (both active and passive), Co-located devices at GFGNL shelter (including Stabilizer and other accessories, power resources UPS, Solar panels spares management till MPLS routers are commissioned at the GP for bringing last mile in ring connectivity.

k) Bidder has to understand the existing Dark fibre cable customers details including but not limited to their splicing and traffic details. During the project as well as in operation phase Bidder is responsible to manage the dark fibres operations and ensure to achieve agreed SLA timelines with end customer. Also, ensure the minimum/no outage on dark fibre customer while working on joint chamber for revised splicing during O&M and ensure to inform to dark fibre customer in advance for smooth operations and satisfactions of dark fibre customers. As on the date of issuance of this RFP, GFGNL has leased approximately 30,000 km of dark fibre to various customers, including Telecom Service Providers (TSPs), Internet Service Providers (ISPs), and other entities. Additional leasing arrangements are currently under progress. Considering that the dark fibre network is a critical asset and represents a key component of GFGNL's business and reputation, the Project Implementing Agency (PIA) shall exercise the highest level of diligence and undertake all necessary precautions to ensure the readiness for deployment/provisioning, reliability, security, and proper maintenance of the dark fibre network/GFGNL customers throughout the contract period.Further, This includes the existing LM connectivity of telco/ISP

towers as a part of dark fibre connectivity and O&M of those dark fibre connectivity will also part of the PIA.

l) In accordance with the Bid Document, M/s BSNL shall hand over the Existing Network to the PIA for Phase-I, and GFGNL for phase-II through its existing O&M agencies, within a maximum time period defined in this RFP in "good condition" (*optical power is in the range -8 dBm to -25 dBm*).

m) The existing O&M agencies shall handover the network Block wise, for those blocks, where at least 50% GPs are having optical power as specified above.

n) The PIA shall take over all the GP locations of the block and will be responsible for O&M of the taken over OFC network as well as active and passive equipments including logistics, replacement of faulty active and passive equipments like but not limited to GPON,Solar equipment, spares management as well as MPLS routers commissioned in replacement of GPON in the Block/GP.

o) The existing agency will be making over the rest of the OFC network of the block to PIA in "good condition" (*optical power is in the range -8 dBm to -25 dBm*) progressively. However, at the end of milestone/time line defined(*i.e., in section* above)for handover takeover completion process, if any challenge on OFC network or any of the active and passive network elements missed to reach to acceptance level, selected bidder has to takeover the network as it as basis and manage the network. i.e., after completion of milestone *in section* above) from appointed date, the entire network shall be deemed to be handover to the selected PIA on as is where is basis.

p) O&M Payment for Non-functional routes after handover payment shall be made only for the routes which are made operational by PIA.

q) ~~In those blocks, where complete OFC network of the block is taken over by PIA and all the GPs are not up, on date of such taking over, the PIA has to make additional 5% GPs of the block as operational every month after 2 months from such taking over date, till all the GPs are made operational. A penalty of Rs. 5,000/- per month per GP shall be levied and deducted from the O&M invoice, for such shortfall of achieving 5% addition in operational GP count of the block, every month from 4th month of taking over date. The GPs becoming operational as per NoC report, will be counted for AMC payments from date of becoming operational.~~

r) In critical cases involving the shifting of a GP, to avoid any delay in service restoration, the PIA shall be solely responsible for arranging temporary aerial connectivity within 2 (two) days(if existing is in linear temporary connectivity in linear or if already is in ring temporary shifting shall also be in ring) from the date of intimation by GFGNL or authorized Government official of GP. The temporary connectivity shall remain operational until the permanent connectivity is restored. Further, upon receipt of intimation from GFGNL regarding confirmation of the final location, the PIA shall complete the shifting of the end site from the temporary location to the permanent site within 10 (ten) calendar days. It is the responsibility of PIA to plan shifting at permanent location properly without disruption of any downtime of services. If the PIA fails to complete the Shifting Event within the prescribed timeline for reasons not constituting Force Majeure and not caused by GFGNL, LD of **INR 2,500 (Rupees Two Thousand Five Hundreds) per day of delay**, capped at **INR 25,000 (Rupees Twenty Five Thousand) per Shifting Event**, shall apply.

Note - The PIA shall participate in the handover/takeover (HoTo) process jointly with GFGNL/IE

in accordance with the provisions of the RFP. Existing network assets, inventory, and network status shall be jointly verified and recorded during the HoTo process, based on the records made available by GFGNL. Any observations relating to missing, damaged, non-functional, obsolete, or discrepant assets identified during joint verification shall be documented and mutually recorded.

5.23.3. MILESTONES AND PROCESS

Toll Gate	Milestone	Field Activity Planning and Managing SLA Phases
1	Pre-Handover Preparation & Handover Planning	The existing PIA will run the operation and Maintenance and the new agency will get the knowledge transfer, documentations and field inventory details.
2	Handover Execution	The new agency will run the operation and Maintenance under the supervision of the existing PIA.
3	Post-Handover Support	Both the party will do the handholding work, documentation and sign-off the satisfactory transfer of work.

Table-0D

Toll Gate 1: Pre-Handover Preparation and Handover Planning

Following are the minimum activities need to take care by the new bidder, where New selected bidder will be solely responsible,

a. Notification: The existing O&M Service Provider shall ensure a smooth and complete handover to the newly selected O&M Service Provider (or vice versa, as applicable). However, newly onboarded bidder will be solely responsible to complete the HoTo Process within given time duration, Wherever applicable admin support will be provided by the tenderer. This includes the end to end network from SDC(state data Centre) Gandhinagar to end termination point till GP(Gram Panchayat) including the details mentioned in the field survey report of Table-0B and Table-0C.
b. Documentation Review: The new O&M Bidder shall review all documentation, including network diagrams, asset lists, asbuilts, inventories and maintenance records. New O&M Bidder will be solely responsible to modify as per the field conditions and update the records by preparing the valid documentations and approval from authorized GFGNL officals.
c. Failure to provide accurate and complete documentation within the stipulated timeline, GFGNL reserves the right to impose suitable deterrent measures, including financial adjustments, as deemed appropriate by the Competent Authority. Such measures shall be determined based on the extent of non-compliance and impact on project continuity, without prejudice to GFGNL's right to recover actual demonstrable losses.
d. Site Visits: The new O&M Bidder shall conduct site visits to familiarize themselves with the network infrastructure and assets.
e. Handover Plan: The existing O&M Bidder shall prepare a detailed handover plan, including a

timeline, milestones, and responsibilities.However, the newly onboarded bidder will be solely responsible.

f. Resource Allocation: The new O&M Bidder shall allocate necessary resources(FRT,Technical,etc.), including personnel, equipment, and vehicles, for the handover process.
g. Training and Knowledge Transfer: The existing O&M Bidder shall provide training and knowledge transfer to the new O&M Bidder on network operations, maintenance, and troubleshooting.

Toll Gate 2: Handover Execution

a. Network Takeover: The new O&M Bidder shall take over the network operations, maintenance, and troubleshooting responsibilities.
b. Asset Transfer: The existing O&M Bidder shall transfer all network assets, including equipment, spares, and tools, to the new O&M Bidder.
c. Testing and Validation: The new O&M Bidder shall conduct thorough testing and validation of the network to ensure it meets the required standards and specifications.

Toll Gate 3: Post-Handover Support

a. Support and Assistance: The existing O&M Bidder shall provide support and assistance to the new O&M Bidder for a period mentioned in Table-0D above to ensure a smooth transition.
b. Issue Resolution: The new O&M Bidder shall resolve any issues that arise during the post-handover period, with the support of the existing O&M Bidder.
c. Final Handover: The existing O&M Bidder shall formally hand over the network operations, maintenance, and troubleshooting responsibilities to the new O&M Bidder.

5.23.3.1 Selected bidder has to share their internal escalation matrix with the IE/GFGNL/DST. And same also need to fix at every GP end with approval from GFGNL for better network manageability and co-ordination.

I. The bidder should maintain the contact detail throughout the project tenure. The bidder has to share all field and back-office resources contact details (Mobile numbers, email IDs, etc.). The bidder has to share their internal escalation matrix including contact details throughout contract duration with IE/GFGNL. The escalation matrix must be stick at critical locations like GP, sub-blocks,SDC/SNOC,shelter sites,etc. In future, if any change in it, bidder has to inform in advance to GFGNL and the updated details need to keep at critical sites for support system.

II. **Network design/Change Documentation handover:** Once the bidder is onboarded, selected bidder has to ensure to submission of following but not limited to within the first quarter of assigned WO/LoI:

i) Network Connectivity Diagram, configuration files
ii) Risk register
iii) Inventory register
iv) Transport network OSNR report/RSL Report

v) GPON Network structure along with RSL Report
vi) Network Traffic Flow
vii) Network IP Schema with it's change management & DCN Engineering
viii) Repair and Return Process
ix) Escalation matrix for OEM
x) Network SLD and LLD
xi) Spare inventory of Active and Passive
xii) Network creation and customer traffic details.
xiii) Other report as per RFP clauses mentioned above including section " MIS Report" . Indicative Summary of Reports.

GFGNL will support wherever possible from existing bidder, However, new selected bidder will be solely responsible to collect and preparation of these all documentations.

5.23.3.2 MIS REPORTS

Bidders are required to provide below mentioned MIS reports but not limited to:

Sr. No.	Report Type	Periodicity
1.	HoTo Field Survey Report	**Daily**
2.	Availability of Devices live vs faulty	**Daily**
3.	Daily Fibre cut brief details with location, affected sites, MTTR, etc.	
4.	Total No. of complaints raised	
5.	Ageing Report of issues/Complaints/Incidents	
6.	Summary of issues / complaints logged at the Help Desk	
7.	Summary of resolved unresolved and escalated issues / complaints	
8.	Summary of resolved unresolved and escalated issues / complaints to vendors/other Bidder/Service Provider.	
9.	Receive Signal Strength at LM including connectivity media(indicating an alert if the signal strength is below the defined threshold)	
10.	Real-Time Attendance report of field and backoffice manpower(On-line)	
11.	Bandwidth Utilization (max, min and average)	**Weekly**
12.	Issues/Complaints Analysis report for Network, call trend, call history, etc.Summary of systems rebooted.	
13.	Summary of issues / complaints logged with the OEMs.	
14.	Summary of changes undertaken in the Project including major changes like configuration changes, Parts Replacement, patch upgrades, database reorganization, storage reorganization, etc. and minor changes like log truncation, volume expansion user creation, user password reset etc.	
15.	Inventory and spare materials reports	
16.	Software upgrade/enhancement reports per network element	**Monthly**

Sr. No.	Report Type	Periodicity
17.	Network Availability Report. SLA compliances with all categories mentioned in RFP	
18.	Configuration change reports	
19.	Preventive maintenance reports of Shelter Sites	
20.	Detail Report including section wise Aerial to UG required details(format to be decided mutually between GFGNL and PIA)	
21.	Cumulative Attendance report of field and backoffice manpower	
22.	SLA compliance reports	**Quarterly**
23.	Preventive maintenance reports of each sites	
24.	Scheduled maintenance reports	
25.	Change Management Reports	
26.	Service Availability, Downtime, Usage/Utilization, Fault & rectification, Performance statistics-, Log of Network parameters along with Service down time and % uptime achieved	
27.	Fiber core health report – Live/break/lossy (Full Timestamp report from OTDR)	
28.	Summary of fault/complain reported and pending at different bucketization including at GFGNL end along with brief data details	**Daily/Weekly-Monthly Summary**
29.	Any other reports- As and when required by Tenderer	
Note: The selected bidder shall submit the all above reports as mentioned on a regular basis over e-mail and as per the prescribed formats provided by the GFGNL. Frequency and report types are indicative at may change as per the requirement. In addition of above GFGNL may ask to provide customized report as per customer requirement. Delay in the billing process due to non-adherence of above compliances/report submission will be sole responsibility of the Bidder.		

Quarterly review meeting with GFGNL internal stakeholders and selected bidders core team on performance review which includes network availability, spare, resources/manpower availability and payment criteria will be part of this and selected bidder appointed SPOC has to join and if ask with their stakeholders including OEM.

a) Change Management

The activities/process shall be digital and software error free, which may include the following, but not limited to :

I. Tracking the changes in hard / soft configurations, replacement of faulty equipment, changes to policies, applying of upgrades / updates / patches, etc.

II. Plan for changes to be made - draw up a task list, decide on responsibilities, coordinate with all the affected parties, establish, and maintain communication.

III. Any changes (as and when required) at the architecture or configuration level for GFGNL related components is part of the O&M activity and it should be carried out by the PIA.

IV. As GFGNL is upgrading the network and look after network utilization under different Projects like Horizontal connectivity, Dark fibre lease, etc, PIA is responsible to maintain all relevant active and passive component as per RFP guideline. It is in bidder's scope to support for

change management activities of GFGNL. No any additional CAPEX and/or OPEX will be given to PIA.

V. If GFGNL found, existing Resource / Team are not capable to meet MTTR/network SLA than Bidder have to increase the resource on his own cost to meet Network SLA/MTTR as per GFGNL Requirements. After demanding the Manpower if Bidder not providing the extra resource within given timeline penalty may applicable as per manpower penalty of section.

VI. PIA will assist in Software integration whenever required.

VII. Conversion of Aerial OFC Network to Underground (UG) including route rectification

a) The selected Bidder shall be responsible for conversion of existing aerial Optical Fiber Cable (OFC) network to Underground (UG) infrastructure, as detailed below:
    i. Approximately ~40% of Phase-I network and ~8% of Phase-II network, aggregating to ~11,000 km of OFC network, presently in aerial condition or damaged. 351 Rs.(Including Taxes) Per day per GP willbe given to PIA for O&M of existing OFC network including electronics, route rectification, Aerial to Underground conversion, and to achieve fiberization principles stated in RFP up to initial 3 years from the appointed date and/or till the 100% Go-live whichever is earlier, shall be considered for aerial to UG conversion with the same size of existing UG OFC specification and given EI.
    ii. The conversion of the aforesaid network into UG infrastructure shall be mandatorily completed within the first three (3) years of the project duration.

b) The cost for aerial-to-UG conversion during the initial three (3) years shall be deemed to be included within the O&M rates, as follows:
    i. INR 351 (Including Taxes) per GP for Phase-I and Phase-II
    ii. No additional payment shall be admissible for this scope during the initial three-year period.

c) The Bidder shall ensure near 100% (not less then 95%) conversion to UG within the completion of three (3) years from the agreement signed date.Upon completion, the Bidder shall submit a formal undertaking, duly certified by the Independent Engineer (IE), confirming compliance with the UG conversion requirement.

d) The Bidder shall submit weekly progress reports in a format prescribed by GFGNL. Further, for this, Periodic inspections and audits shall be conducted by: Independent Engineer (IE), and/or GFGNL, and/or any other Third-party agency nominated by GFGNL.The Bidder shall extend full cooperation during such audits and inspections.

e) After completion of the initial three (3) years and/or after 100% Go-Live, any remaining aerial network (not more than 5% of initial) or additional UG conversion requirements shall be addressed through a "*Change Management Process*". Based on observations and recommendations of GFGNL / IE / authorized third-party auditors, specific change requests may be approved.Approved works under change management shall be executed based on discovered rates through this tender.

f) Newly Approved conversion works under change management shall be completed by the Bidder within forty-five (45) days from the date of approval. Payment shall be released only upon satisfactory completion and certification.

g) In case of failure to complete approved works within the stipulated timeline, a penalty

of 5% of the value per week of the pending work/section shall be levied.

VIII. Following are the key stakeholders and their responsibilities for change management.

a) GFGNL(Tenderer)

- Approve change requests and provide necessary technical guidelines.
- Communicate project priorities and timelines for change implementation.
- Monitor compliance and performance during and after change execution.

b) PIA (participated bidder)

- Submit detailed change request proposals with impact analysis.
- Execute approved changes within stipulated timelines ensuring zero downtime.
- Maintain temporary arrangements (aerial/UG) at its own cost until permanent changes are completed.
- Provide updated documentation and configuration records post-change.

c) IE/Third-Party Vendors (if applicable)

- Cooperate with PIA and GFGNL for review, feedback, impact,integration and testing and give neutral openion.
- Ensure compatibility of systems during upgrades or patches.

5.23.4 NETWORK INVENTORY

~~a. The PIA would be required to maintain an inventory of all the components used in the network and the spares available at the different levels and locations in the ERP software. Warehouse for keeping the spares at BHQ/DHQ shall be in scope bidder.~~

a. The PIA would be required to maintain an inventory of all the components used in the network and the spares available at the different levels and locations in the proposed inventory and asset management tool. Warehouse for keeping the spares at BHQ/DHQ shall be in scope bidder.

b. PIA shall prepare and maintain asset and/or inventory records listing the assets as per site locations required for performing the O&M and the same shall be shared with GFGNL every quarter and as & when asked.

c. At individual site, installed/integrated network elements inventory list should be stick properly and visible at shelter,SDC,GP or the sites those are part of the BharatNet Phase-III network under this RFP scope.

d. PIA has to develop centralized automated change management tool, which will shows the overall online inventory tool, which includes minimum but not limited to materials serial number, mac address, inventory used location, Quantity, summary report, etc. as and when required and will get reviewed every quarter first week. SOP will be shared alongwith workflow requirement for approval from GFGNL stakeholders to selected PIA once onboarded to GFGNL.

e. The PIA shall raise a request to reorder / replacements / replenishments / spares in case the stock level dips below specified % as specified in following table-0E or a faulty unit has been replaced with an operational one. The PIA needs to maintain the spare quantity for entire

contract period. If spare quantity is used due to device fault/operational issue, the cost is to be borne by PIA (The discovery of cost for addition of spare will be done in case applicable).

f. All inventory real time report/dashboard including their spare material counts asked vs available, project performance report including following parameters but not limited to number of GP/Block/District on GPON and migrated on MPLS, GP wise network performance report(Daily-Monthly-Quarterly-Yearly)(fibre loss, latency, jitter, live vs down GPs (MPLS Vs GPON), RFMS report, active elements live vs down, Dark Fibre lease in Kilometers with customer names report per block/district etc. should be available centrally at GFGNL office in display either through suitable software or arranging API or through suitable mechanism. It should be customized based on the requirement of tenderer.

g. The PIA shall keep the required spares for meeting the SLA defined in Section 7. The PIA shall have an agreement with all the OEMs for supporting the supplied products for the life time of the contract (10 years). The OEM shall be bound to supply the spares to GFGNL during the entire contract period as per the MAF on the same commercial terms and conditions.

h. In case any equipment is not repairable due to non-availability of the spares, PIA shall replace the supplied products with equal or upgraded/ higher version during life time of contract (10 years) at free of cost

i. Any equipment or related EMS/ software need to be installed on high availability architecture at SNOC. It is the responsibility of GFGNL to provide necessary hardware to host the software in HA mode. In case, any equipment as part of scope of this RFP at SNOC then sufficient spares at SNOC should be available for entire contract duration.

j. Existing Transport/backhaul equipment at SDC must be 1:1 active and critical for the network, and hence sufficient spares should be available for entire contract duration. Its Bidder's responsibility to manage the transport till the migration to LL from SDC to Master block/sub block or all end traffic from existing transport /backhaul network migration on new technology whichever is later. The end objective is not to disturb end customers due to expansion of ABP.

k. The PIA would be required to check all spares for faults half-yearly to make the site up and running to achieve SLA and after taking permission from GFGNL.

~~l. It is the responsibility of PIA to provide evidencary proof for consitance maintenance of spares limit on every 2nd quarter of O&M bill including numbers clearly proving matching figures as mentioned in above table. Failing to that GFGNL will deduct the 1.5 times shortfall price from the invoices as per the discovered rates in the neighbour states provisioned in the RFP in additional to SLA penalty without penalty cap limit.~~

m. Provisioning of mobile DG set in case of exigency is in the scope of bidder to meet the network SLA. Bidder shall arrange the same to continue the services during the critical needs like, Force-majure conditions and any other needs without asking any reasons for relaxations in SLA. However, Stabilizer at shelter will ~~be addressed by new RFP for shelter readiness~~.also be part of selected bidder's scope.

5.23.5 NETWORK CONFIGURATION/ CONFIGURATION MANAGEMENT

a. The PIA shall be responsible for Network provisioning, Server provisioning and User provisioning.

b. The PIA shall create a Maintenance Manual detailing the policies, procedures, techniques, and tools to manage, evaluate proposed changes, track the status of changes, and maintain an inventory of system and support documents as the system changes.

c. The PIA and its resources shall be responsible for adhering to the processes mentioned in the Maintenance manual.

5.23.5.1. NETWORK AND SERVICE PROVISIONING

The Selected PIA has to perform the following activities but not limited to.

a) The services which are assigned to the customer (i.e., in the customer relationship management (CRM)) have to be provisioned on the network element which is enabling the service and allows the customer to actually use the service; the PIA would be responsible for the same.

b) The network shall enable retail, enterprise and wholesale services as per the requirement of GFGNL.

c) PIA shall provide all necessary support and facilitation to GFGNL,designated service provisioning agencies for provisioning and monitoring of services from NOC and as well as to the existing agencies of horizontal/LMCA customer connectivity and the revenue sharing partners onboarded through GFGNL/DST.

d) The PIA shall ensure service assurance and accounting for all provided services from the network.

e) The network shall enable retail, enterprise and wholesale services as per the requirement of tenderer.

f) PIA shall provide all necessary support and facilitation to GFGNL and designated service provisioning agencies for provisioning and monitoring of services from NOC.

g) The PIA shall ensure service assurance and accounting for all provided services from the network.

h) All the DC, DR (if approved) of BharatNet, along with GoI infrastructure must function as a single unified network for all purpose of O&M, Upgradations and expansions and accordingly all the integrations must be planned, implemented, tested and demonstrated and commissioned to GFGNL (BharatNet network means the combined network of BharatNet Phase-I, BharatNet Phase-II and newly created network under ABP).

i) Following are the minimum requirements, but not limited to, the PIA must adhere to. Failure to comply may impact payments to the PIA due to non-achievement .

Sr. No.	Requirement Description	Deliverable	Timeline (from Agreement Signing)
1	The selected PIA shall review the existing Network Architecture, HLD, and LLD of BharatNet and GFGNL networks and prepare a consolidated architecture.	Consolidated Network Architecture Diagram, HLD and LLD submitted to GFGNL/IE for approval	Within 12 weeks
2	The PIA shall prepare and submit the detailed integration and implementation plan.	Integration and Implementation Plan submitted to GFGNL/IE	Within 12 weeks
3	The PIA shall review existing IP schemas and propose a unified IP schema planning.	Combined IP Schema Plan submitted to GFGNL/IE for approval	Within 12 weeks
4	The PIA shall develop and submit Operations & Maintenance (O&M) documentation.	O&M Manual and O&M SOPs submitted to GFGNL/IE for approval	Within 16 weeks
5	The PIA shall ensure consolidation and loading of inventory data of BharatNet (GoI) and GFGNL networks covering all active and passive components into the designated tool.	Complete inventory data uploaded and submitted to GFGNL/IE	Within 12 weeks

j) The network shall enable retail, enterprise and wholesale services as per the requirement of GFGNL.

k) PIA shall provide all necessary support and facilitation to GFGNL and designated service provisioning agencies for provisioning and monitoring of services from NOC.

l) The PIA shall ensure service assurance and accounting for all provided services from the network.

m) PIA shall ensure all the services provisioned or to be provisioned to be tested, validated with prior approval from GFGNL/ IE as part of the network configuration for service rollout.

5.23.5.2. SERVER PROVISIONING

~~a) Server (Computing) and Storage for all software applications like NMS along with all other applications such as ERP, Project management tool, web portal mobile, etc. will be provided by GFGNL.~~

a) NMS,OSS, BSS, CRM and GIS web application require to be hosted at SDC,GFGNL shall facilitate bidder for handshake with SDC authority and permission,EMS are to be hosted at HCI propsosed by Successful bidder. Any Mobile app is to be hosted at HCI.

b) Implementation, configuration and management is under PIA scope of work. Further, loading of the appropriate software (operating system, device drivers, middleware, and applications), appropriately customizing and configuring the system and the software to create or change a boot image for this server,devices including all network elements like router, switches,etc and then change its parameters, such as IP address, IP Gateway to find associated network and

storage resources assignment is under PIA scope of work.

5.23.5.3. USER PROVISIONING

a) The PIA shall be responsible for change propagation, self-service workflow, consolidated user administration, delegated user administration, and federated change control; the PIA shall provide users access to data repositories/Software/Systems or grant authorization to systems, network applications and databases based on a unique user identity or as requested by GFGNL

b) The PIA shall be responsible for end-to-end provisioning including but not limited to necessary VLAN creation (if required), IP assignment and bandwidth provisioning for all customer services including horizontal customer connectivity, RSP, wholesale-retail-enterprise business.

c) The PIA shall be responsible for discovery of customer's device/port where bulk bandwidth is terminated from GFGNL Network and required SLA monitoring.

d) The PIA shall also ensure that all software upgrades / patches / updates are applied to the network elements in a timely manner as soon as these upgrades/patches/updates become available.

e) The PIA shall make available hardware resources, such as computers / laptops, mobile phones and tablets etc. required for the implementation and maintenance of the network for field resources as required.

f) The PIA would be responsible for ensuring compliance of all network elements, applications and personnel to standards as specified in this RFP or GFGNL/DoT/GoI/GoG/TRAI or any of applicable government laws for installations and provisioning of services.

g) PIA shall extend access of the Network Management System or other equivalent systems along with network performance reports on a mutually agreed basis either through API to existing available GFGNL's NMS or suitable mechanism to GFGNL-SNOC, BharatNet Delhi and Bangalore NOC.

h) The services provided shall adhere and conform to applicable security policies and guidelines issued by DoT/TRAI/GoI/GoG.

5.23.6 FAULT RESTORATION SERVICE

a) PIA may deploy a dedicated fault resolution team (FRT) at the Block level and at any appropriate places like annexure-high speed corridor route atleast two patrolling resource at every 250 Km or it will be further decided by the GFGNL for effectively management and strengthen of network .This distance is indicative however, PIA has end to end responsibility to manage the SLA and hence, additional resources(FRT, patroller with their supporting maerials) shall be deploy ~~increase~~ to achieve SLA without any additional cost to GFGNL. It is the bidder's responsibility to deploy sufficient skilled manpower for surveillance, liaison, and patrolling. The bidder shall deploy additional manpower, as and when needed during any work by other agencies to safeguard

GFGNL network without additional cost to GFGNL. The bidder shall manage resource planning in order to meet service expectations to GFGNL and it's customer and maintain SLA, quality parameters.

b) The Maintenance teams shall comprise of manpower, logistics, required tools/tackles/machinery & equipment.

c) The PIA shall provide OFC maintenance service on round the clock basis for attending & rectifying the OFC fault in minimum downtime (including travel time) from the time of lodging the complaint to the representative of PIA.

d) The PIA shall provide all assistance including providing manpower, transportation of men and materials etc. in the event of failure. The PIA has to provide minimum 2 member's team per district for ROW applications and follow-ups and a dedicated ROW coordinator to act as a SPOC for GFGNL

e) The PIA shall provide conveyance facilities for maintenance, for transporting the manpower, tools/tackles, Test/Measuring equipment and consumables like: OFC cable, Joint Closures, Jointing Pit, duct, couplers, etc. Suitable vehicle shall be available round the clock with each of the maintenance team. Vehicle should be in good working condition.

f) The PIA shall provide communication facilities viz. mobile phones to members of the maintenance teams.

g) The PIA shall be required to carry out maintenance activities which include identification of OFC fault/cut on ground, obtaining permission from local authorities if required, excavation of earth to expose cable, laying of required length of OFC with protection wherever required, splicing of OFC, installation of Jointing pit & back filling of pit with sand, supply and installation of cable Route Markers and Joint Markers as per specification, testing of OFC and updating of OFC as-built drawings etc.

h) The PIA shall arrange for logistics to provide facilities such as AC/DC power source, lighting arrangement, dewatering facility, DG sets etc., which may be required during the execution of maintenance job at site.

i) Optimum functionality of maintenance teams is a prime necessity to carry out day to day maintenance of OFC links. OFC and accessories spares to cater for repair of at least 10 fibre cuts shall be always maintained with each of these teams.

j) PIA shall take insurance for all the workmen engaged under this contract as per labour laws applicable from time to time.

k) Up to 50% of target achievement will be accepted in Rainy Season months i.e. July, August, September and beyond 50% for non-achievement of targets, Penalties shall be applied. In case of excessive rainfall declared by district collector and then monthly milestone count will be zero, no penalty will be levied for particular month, subjective to the GFGNL competent authority approval on submission of valid evidences on resulting in work cannot be executed. However, Situation can be monitor district wise and suitable decision can be taken.

l) The sharing of FRT team and patroller is not allowed. The GFGNL has the rights to view digital tracker to understand any sharing related information. Any non-compliance or any attempt of willful sharing the FRT team and patroller for saving the FRT team and patroller direct expenses will result into non – availability of FRT team and patroller and necessary deducation provisions related to absence of FRT team and patroller will be applied.

m) Maintenance and Facility Management:

i) Configuration/Re-Configuration of Equipment and Services1. The bidder must handle configuration and re-configuration of all equipment and services as needed during the contract period.

2. A record of all hardware and software configurations must be maintained, including details of policies **(i.e Quoted solution technology protocols).**

3. Ensure regular backups of configurations at least every 24 hours, with confidentiality and restricted access.

ii) Fault Management

1. All the infrastructure equipment and systems supplied shall have inbuilt facility to extend alarm through potential-less NO/NC (normally open/closed) contacts or through change of suitable voltage levels as required by the equipment. Transport device should support through Ethernet Port for alarm extension.

The minimum set of alarms required are

a) Power failure alarm
b) High temperature alarm
c) Battery Low (Voltage of the battery bank below a threshold level) alarm
d) Cabin Door open alarm
e) Fire Alarm

2. Technical resources must attend to and resolve faults, ensuring tickets remain open until full resolution.

3. Following project handover, the PIA will manage ticketing and resolution.

4. For non-rectifiable faults, the SPOC will raise a ticket with the OEM and oversee rectification or equipment replacement.

5. Bidder’s technical resources must reconfigure any replaced devices.

iii) Fault Ticket Monitoring and Escalation

1. SPOC must monitor ticket resolution progress with the OEM for SLA calculation.

2. An Escalation Matrix must be provided for project implementation and support phases.

iv) Firmware and Software Upgrades

1. Bidder is responsible for regular firmware and software upgrades for supplied equipment and EMS without any cost of GFGNL.

2. Any upgrade impacting the network must receive prior approval from GFGNL and should be plan in non-business hours (12 AM to 6 AM preferably).

5.23.7 METHODOLOGY FOR FAULT RESTORATION/FIBRE CUTS

Under OFC link cut condition, the following minimum activities shall have to be taken up by the PIA for its restoration for the end-to-end restoration of the network traffic/service.

I. On receipt of information of fault in OFC the team stationed shall move immediately for locating and rectifying fault as per the response time given below. The working fibres shall be restored first. Sufficient labour shall be engaged for speedy restoration. Adequate care shall be taken not to damage any other cable if laid in the same trench.

II. For the identification of exact fault location on immediate basis, the OTDR measurement of spare fibre shall be made from the nearest PoP. For better clarity, the OTDR measurement on spare fibre shall be taken at PoP / nearest OFC joints situated at both ends of cut and using dummy fibre spool of 1km, in case required.

III. After the OTDR measurement, the as-built drawing shall be referred and the physical site of fault on ground shall be located. It may be possible that data in as- built document or existing facilities in GIS for BharatNet Phase-II -GFGNL not be correct for the accuracy purpose. As-built drawing shall be taken as reference only. No claim of PIA will be entertained on account of this. Accordingly, locating the OFC fault, the job of excavation in all types of soil, identification of OFC, blowing of cable, construction of jointing pits, splicing of OFC, back filling of trench & jointing-pit shall be taken up as per the standard procedure. This should be incorporated in the cable route plan also. The splicing of fibres is to be carried out in line with the installed fibre and measurements are to be taken on spare fibres. In case the active fibres are to be used, precautions are to be taken with regard to the power launched on to the fibre. Restoration of site shall be done to the entire satisfaction of GFGNL and detail asbuilt to be submitted and updated in GIS to avoid further mismatch on field for field database Vs GIS database.

IV. In case of OFC cut where it is not possible to pull the cable from either end, the PIA has to make two pits/ splicing joints between the required lengths of new OFC to be laid between the two joints. The spacing of joints/ pits shall be depending up on situation at site and shall be as decided by Site Engineer. Remaining OFC has to be coiled in both the pits. Wherever new joint is provided or existing joint is attended for rectification during the maintenance period, joint shall be buried to the depth of 1.2 Mtr. from the ground level in joint chamber.

V. For existing fiber infrastructure that is either aerial (above ground) or underground (UG), any expansions or repairs need to be taken care of by the Project Implementing Agency (PIA). The PIA has to ensure that the same size core fiber is used whether the infrastructure is underground or above ground/aerial. This is to maintain the standards set out in the infrastructure, Service Level Agreement (SLA) and avoid penalties. This will also help to ensure that customers receive their services without disruption and maintain network uptime.If the government authority develops the infrastructure in the field changing the aerial to underground, the PIA will have to work on it and shift it back to underground within a month.Failure to this, GFGNL has rights to take appropriate penalties to PIA.

VI. After the completion of site activities, the PIA shall ensure the restoration of the traffic from the associated Network Operations Center (NOC) and thereafter fresh OTDR measurement & traces

shall be taken for all fibres & submitted to GFGNL representative. After the completion of site activities & hop test, the As-built drawing shall be updated by incorporating the new details like OFC loop used, Joint-pit location, etc. The length of loop in joint pit after fault restoration shall be incorporated in as built drawings and send to GIS for updation.

VII. After attending the fault & permanent restoration, a Fault-Rectification report jointly signed by GFGNL representative and PIA, shall be generated for the closure of the complaint. Any other job required for the restoration of the OFC fault/cut in totality is to be taken up by the PIA.

VIII. In case the site condition is not favourable for the immediate restoration of the fault, the temporary restoration of the service fibres shall be taken up immediately with the approval of GFGNL. Permanent restoration work will not be considered in downtime unless there is link break again during restoration job. Permanent restoration of joint pits is to be carried out by PIA within reasonable time of fault / OFC cut. In case the site is not conducive for permanent restoration, some arrangement of manpower has to be done by PIA for safeguarding exposed OFC till permanent restoration. No extra payment shall be given to PIA on account of deployment of additional manpower. In case of further cuts at exposed OFC location, PIA will be accountable for this additional downtime of OFC link. It is mandatory for the PIAs to install the jointing chambers after permanent restoration is done.

IX. In case of any breakdown in the OFC network, PIA shall be responsible for obtaining approval at his own cost from statutory authorities like Municipal Corporation, Development Authorities, Electricity Department PWD, NHAI and any other concerned authority as required for carrying out the repair. GFGNL may assist in getting permission for repair wherever possible in case of urgency. Drains, pipes, cables, overhead wires and similar services encountered in the course of the works shall be guarded by the PIA at his own cost, so that they may continue in full and uninterrupted use to the satisfaction of the Owners thereof.

X. Any damage be done by the PIA to any AC Power mains, utility pipelines cables or lines (whether above or below ground etc.) whether or not shown on the drawings, the Selection of PIA for BharatNet Phase-III GFGNL must make good or bear the cost of making good the same without delay to the satisfaction of the GFGNL.

XI. PIA shall follow all national and local laws, ordinances, rules and regulations and requirements pertaining to the work and shall be responsible for extra costs arising from violations of the same.

XII. PIA shall have at all times during the performance of the work, a competent supervisor at block level. Any instruction given to such Supervisor shall be considered as having been given to the PIA.The PIA shall employ as many personnel as deemed necessary to comply with the local rules and administrative orders governing the Working Hours of Employment. The PIA shall be responsible for compliance with all statutory requirements including personnel related matters. In the event of urgency, the team has to move to the adjacent section. The minimum down time shall include time taken in restoration of fault/cut caused by any means like miscreant activity at day or night, due to work done by any other organization, development of high losses / break at existing joints, fault caused due to rodent, ant etc. In case of partial damage of the cable or development of high loss in the working and spare fibre or cable cut at any time (day/night) by miscreants or by any agency, the responsibility of repairing the defective fibre lies with the PIA.

XIII. In case PIA fails to completely restore the fault (as per original condition) or submit OTDR & test (power level in live equipment) records to establish completion of work, a penalty shall be levied

for the work involved at site.

XIV. When finished work is taken down for the purpose of inspection for any reason, the MSI shall bear the entire expenses incidental thereto in the event that the said work is found to be defective. This situation may be applicable to both planned work as also to emergency restoration. During the maintenance or fault rectification work, should any damage occur to the other cables, PIA is solely liable to pay compensation as demanded by the respective authorities.

XV. Being a critical component of the network, Bidder has to ensure, RFMS solution must be deploy with full functionality across existing and new network for uniformity with addition of other active and passive network elements.

XVI. Standard Operating Procedure(SOP) will be shared to selected bidder once onboarded with GFGNL.

5.23.8 PERIODIC MAINTENANCE

a) **The periodic maintenance** of the network shall be done in such a way that atleast every site with all its component will be covered once in every month.

b) The periodic maintenance activity detail report with action taken/required must be submitted to GFGNL every 1st week of the month.

   i) Periodical Maintenance is a part of Operation Activity along with all relevant reports as per RFP clause mentioned above. Indicative Summary of Reports to be handed over to new O&M BIDDER especially field related report ~~of last one year~~. (Monthly, Quarterly, and yearly).

   ii) Selected bidder has to monitor the route periodically/daily during the O&M phase and take necessary advance safety precautions for the network availability including but not limited to Gujarat Water Supply & Sewerage Board (GWSSB), Govt/private Bidder work on same route/RoW.

   iii) This Existing bidder will try to hand over fully functional Network. However, any damaged or down devices selected bidder has to either fully repaired or replaced.

The corrective maintenance of the network shall also to be done for ensuring the network availability/ uptimes as per the SLAs.

I. If any issue is reported by the end user (GP, Block or through NMS or the monetizing partner) with regards to the services, then the issue shall be reported to centralized help desk of NOC of State/SIA and if there is any issue in the network connectivity, the issue shall be forwarded to the respective BIDDER. These issues shall be rectified so as to restore the services as per the SLA. Issues pertaining to the OLT / ONT / Rack Mounted Splitter / FDMS / OFC / electrical utilities / other active or passive equipment installed by the BIDDER shall be handled by the BIDDER. However, if there are issues with State/SIA, it shall be reported to respective stakeholders. In case of theft/physical damage (Repair not possible -RNP) to the Network components / equipment, the equipment shall be replaced with equivalent or higher configuration/Capacity by selected Bidder.

II. Lodging of FIR will be done by the selected bidder and same to be submitted to GFGNL by PIA for reference. FIR launched by the Block/Gram Panchayat authorities followed pertains

to this project will be followup by the selected bidder and same to be submitted to GFGNL by PIA for reference.

III. If the pole has fallen down or replaced by electricity department/external Bidder and cable has been damaged such that it cannot be used further, then State/SIA shall bear cost of cable, Pole (if required) and other pole kits. But the BIDDER shall bear the cost of workmanship and other store like jointing kits etc.

IV. BIDDER will be responsible to replace a patch/route of OFC cable and/or duct for suitable length if optical losses are increased due to added splice joints or due to various cuts or due to wear and tear and damage by external agency/s or optical loss is below the standard threshold level(details mentioned in scope of work). GFGNL will not bear any kind of cost like but not limited to transport, permit, material and workmanship cost for above maintenance activity. However, routes should be updated in GFGNL GIS as well as reported in NMS with time stamp during the same quarter.

V. During the O&M project duration, there will be requirement for OFC & electronics shifting due to GP building construction/renovation.

VI. Shifting within 500 meter length/running meter from the nearby junction point to GP premises boundary end point will be in bidder's scope including dismantling, transportation, supply of installation material, integration/commissioning/(if in case revised configuration), and O&M of site for upto ~~1%~~ 3% of GP scope. Relocation/Shifting/dismantling of Mast/Pole/Radio/Li-fi links due to relocation of GP/Government Building/or any other challenge. It will be in selected PIA's scope with no additional cost to GFGNL.

VII. For more than 500 meter distance shifting cases or beyond 3% GP scope for shifting including dismantling, transportation and supply of installation material the PIA shall be paid for additional work (material as well as workmanship) as per annexureF for initial 3 years from Go-live and after 3 years, rate assessment will be done based on tender discovered rate with preference of sequence as below.

- GoG/GFGNL latest tender,
- BSNL tender of Gujarat
- BSNL tender of Madhya Pradesh
- BSNL tender of Rajasthan.

"Shifting on temporary basis due to GP renovation/reconstruction/utility fault etc shall be immediately done (within 3 calendar days) at the location given by the GP authority or as conveyed by GFGNL for the restoration of services at no additional cost to GFGNL. Unjustified delay in shifting resulting in either non-use of equipment or poor service at village level, shall not be eligible for O&M payment for delayed no of days.

VIII. If road widening work or construction of culvert,bridges,drainage is taken up by Government department in future or field activities on Government infrastructure/utility replacement or expansion for water pipelines, drainage lines, GAS Pipelines, etc. on any network stretch or there is work carried by government agencies or their nominated agencies on same trench and GFGNL network is damaged.

For this cases, upto 300 meters of road/path length/running meter will be rectified by the

bidder including shifting infrastructure /chamber shifting/rework/etc. without any additional cost to tenderer.

For more than 300 meters road/path length/running meter, selected bidder will be solely responsible for this additional/replacement work of fibre including shifting of infrastructure /chamber shifting/rework that needs to be carried out. For this Cost (material as well as workmanship) of all O&M activities will be borne by State/SIA.

In this State/SIA will pay as per Annexure-F (for existing rates of OFC rectification work) during initial 3 years from Go-live and after 3 years, , rate assessment will be done based on tender discovered rate with preference of sequence as below.

- GoG/GFGNL latest tender
- BSNL latest tender of Gujarat
- BSNL latest tender of Madhya Pradesh
- BSNL latest tender of Rajasthan
- BSNL latest tender of Maharastra

GFGNL or it's authorized agency has rights to take sample base field inspection of any affected route. The PIA shall be paid, for such replacement of damaged sections after getting firm work order. PIA may coordinate for raising demands from agencies requiring shifting of cables,if applicable, before taking approval for such replacement of damaged sections. In such case,the PIA will also be required to restore the GP using Aerial/Over head(OH) OFC on temporary basis within 12Hrs, else, SLA penalty will be applicable.

Similarly,for the cases beyond 300 meters running meter where only fibre shifting and/or back pooling is required, selected PIA will be solely responsible and GFGNL will not pay any additional payment to PIA.

IX. In any case GFGNL infrastructure is damaged by the third-party agency same will be treated as per clause above(VII).

X. PIA should minimize network impact with chamber shifting within time.

XI. During maintenance of the network, BIDDER will ensure that all fibre cores are spliced at the cut location (and not only live fibre cores) during rectification process. State/SIA/any third party as appointed may audit the health / continuity of all fibre cores at any time and BIDDER will have to facilitate this exercise by performing LSPM and OTDR testing in presence of this team.

XII. In above mentioned all different categories, BIDDER will raise request on time and GFGNL approve the respective request on case by case. Based on approved request and different category of pending work to be carryout by Existing BIDDER before handover the Network or same pending work amount will be deduct from existing BIDDER Operation BILL/SD of O&M as per Change Request rate/SOR rate as per Item wise discovered.

XIII. All Operation activity should be handed over on GIS along with installed Operation inventory like Chamber, Route Marker, Cut Location, Route Change, Expansion of network etc.

XIV. **The Preventive Maintenance:** The Selected PIA shall undertake all preventive measures with the information to respective authorities for maintaining the end-to-end continuity of OFC cable, which shall include but not limited to the following:

- Regular surveillance of OFC route along the road should be carried to have proactive check to prevent OFC link disruptions.
- Attending to / safe guarding & rectification against any signs of damage or potential damage of OFC network and equipments/infrastructure of GFGNL.
- Attending breakdown/schedule maintenance within minimum time period. The preventive maintenance should be carried out with prior approval and during planned shutdown/maintenance window only.

For any / all issues pertaining to OFC/Accessories/Electronics etc. for whatever reasons, the fault has to be rectified or OFC/Accessories/Electronics etc. has to be replaced by PIA. The cost shall be borne by PIA for all such events.

The O&M Phase of GP in a block will start once the electronics at GP is commissioned and the GP is discovered in NMS of centralized NOC and End-to-End Acceptance Test certificate has been issued for Fibre infrastructure and electronics for that GP. The O&M of all such GPs shall be provided proportionately till the Project Go-Live date.

The unifying date of start of Project O&M Phase for 7 years will start from Project Go-Live when the electronics for all the GPs covered under BharatNet Phase-III in the State of Gujarat are commissioned and discovered in NMS at centralized NOC and End-to-End Acceptance Test certificate has been issued for Fibre infrastructure and electronics.

5.23.9 OTHER NETWORK O&M PARAMETERS

a) The PIA will assist GFGNL in complying DoT legal requirements.

b) The PIA will be responsible for all field activities of required fibre tapings and e2e testing of fibre in case of delivery of dark fibres to customers / partners and SLA monitoring.

c) The PIA shall provide daily, weekly, fortnightly, monthly, quarterly, half-yearly and annual reports as detailed in NOC section.

d) SLAs shall be monitored (after 6 months from taking over) and reported by the PIA to GFGNL on daily / monthly / quarterly basis, as required. Based on the performance of the network in the prior quarter, the penalty shall be computed and shall be payable by the PIA.

e) In case of any defect, deficiency or deterioration in the Project poses a hazard to safety or risk of damage to property, the PIA shall promptly take all reasonable measures for eliminating or minimizing such danger.

f) The PIA shall insure all the equipment at GP for theft, damages due to fire, flood, earthquake, storm etc for the entire project duration.

g) The scope of work to be undertaken by the bidder for Operations & Management and

Comprehensive Annual Maintenance Contract (CAMC) of the Active and Passive Infrastructure for the GFGNL is mentioned below.

h) GFGNL reservers the rights to handover existing horizontal customer connectivity to selected PIA on existing O&M charges paid to existing agency based on mutual agreement with GFGNL and selected PIA. The SLA and other terms and conditions will be applicable as mentioned in the existing tender and shared to bidder.

i) There are three types of circumstances, viz- a -viz Phase-II equipment, Phase-I equipment and New Phase-III equipment.

Phase-II Equipments: AMC Governance and Contractual Obligations : The Contract for BharatNet Phase-II was awarded in Jan-2019 with 7 years spare and service support from Oct'2020 onwards. Therefore, it is the responsibility of successful PIA to complete the Go-live part including traffic migration within the warranty support period. In case any spill over in the traffic migration beyond this period then PIA is obilized to maintain the equipments without additional cost to the GFGNL. PIA shall obtain AMC to maintain SLA as part of O&M of existing network.

Phase-I Equipments: AMC Governance and Contractual Obligations :The Contract for BharatNet Phase-I was awarded in Jan-2015. The bidder is asked to factoring in 2 years AMC cost as part of CAPEX cycle. Therefore, it is the responsibility of successful PIA to complete the Go-live part including traffic migration within the CAPEX life cycle. In case any spill over in the traffic migration beyond CAPEX life cycle then PIA is obilized to maintain the equipments without additional cost to the GFGNL.

New Phase-III Equipments: AMC Governance and Contractual Obligations : as per the warranty clause and details mentioned in the MAF.

j) PIA has to ensure to include all types of security measures to ensure the network's integrity and data privacy, such as:

- Firewall configuration and management
- NDR(Network Detection and Response) Solution
- Access control and authentication
- Encryption and decryption

The Protocol and security compliance related to the supplied product has to be ensure by the Bidder and OEM as specified DoT/TRAI/GoG/CERT/etc. Thus, offered product /solution must adhere to security norms, prevailing security practices and it should not limit functionality of security activations.

l) PIA shall also be responsible for creating and maintaining security measures at field as well as critical sites like at Shelters, NOC(Network operating Center) by access control system as well

as on field for fibre monitoring and rectifications through patroller/FRT team or by implementing any other technology to ~~save~~ safeguard the infrastructure.

k) Existing GP Powerbackup/UPS having 1 KVA capacity with 2 hours back up. Bidder shall repair/replace faulty UPS / low power backup UPS as part of existing network O&M. For better uptime, bidder may also replace the existing UPS with new to achieve atleast minimum 6 Hours of Back up to achieve target SLA. The Uninterruptible Power Supply (UPS) should have the inbuilt functionality as a stabilizer. Further, if any issues arises such as the phase and neutral wires shorting out or any damage caused by voltage fluctuations, it will be the responsibility of the Project Implementing Agency (PIA) to handle it. This is to manage the uptime and ensure the network remains operational in power/electricity issues. Additionally, any need for extra wiring or other similar tasks will also fall under the scope and responsibility of the PIA.

Note: Existing UPS systems may be utilized during the existing O&M period to maintain required SLA. Bidder shall repair/replace faulty UPS / low power backup UPS as part of existing network O&M. For better uptime, bidder may also replace the existing UPS with new to achieve atleast minimum 6 Hours of Back up to achieve target SLA. All existing UPS systems shall be replaced with new UPS units providing minimum 6 Hours backup as part of GP upgradation.

l) There may be the case, many of the active and passive equipments are under or out of warranty period. Selected PIA has to ensure to take the warranty and AMC of both active and passive network elements for BharatNet Phase-I & II for the same duration as mentioned in the appropriate clause in this RFP document. Similarly, To mitigate risk from power fluctuation, or aging or other causes of device failure, the PIA shall besides keeping the spares (~~as mentioned in clause 5.7.2)~~, also obtain necessary warranty and AMC support from the manufacturers of passive components.

m) Bidder needs to design the network for traffic diversion and future scalable options , bidder needs to supply, install, test, commissioning and O&M of any equipments/infrastructure developed into/for the requirement of Phase-3 Bharatnet network.

n) In case any equipment is down and fibre cut or infra damage, either reported by GFGNL or its designated agency or monitored through EMS/NMS, selected SI will attend the fault and rectify the same, Selected bidder will be solely responsible for this.

o) Bidder will have to supply license EMS (Element Management System) for each active components like but not limited to radios, router, switch, Li-Fi, Mini-OLT/ONT etc. used in network so that required alarms can be monitored and also remotely monitor to know atleast the OFC cut Issue, Power Issue(Utility),Equipment- cold Start, warm Start, link Down, linkUp, authentication Failure, latency, Jitter and Neighbor Loss status related performance parameters, Proactive alarms of each equipment from day-01 of device integration in network and mapped in Bidder's NMS on day-01.

p) Bidder has to provide all active elements and its network performance like but not limited to, Services, link performance- Availability(Up/Down) including reason of outage-alarm Management, Throughput, latency,packet drops, jitter,Tx-Rx level ,For Wireless (RSSI) etc. through EMS (preferably licencense based EMS) and integrate with GFGNL's NMS either through API or by providing suitable mechanism without any additional cost to GFGNL.

q) There should be an EMS for monitoring major parameters including Input & Output Voltages, Inside & Outside Temperature, Alarms, % battery back up time left. The monitoring should be possible from SNOC/ Central NOC in real time. Delay in any alarm incident will invite the penalty. For example, for any instance on delay in alarm will be penalized with 0.2% of quarterly O&M billing amount and this will be over and above the maximum O&M cap limit of the O&M billing amount. .(The purpose is not the smart rack)

r) Minimum Last 24 hrs (at least) Alarm & Access events must be stored with Date & Time stamp.

s) If the OFC cable cut is such that the cable has been damaged for distance more than 300 meter by any external agency, such as waterpipelines, drainage lines, Telecom cables, UG power cables, Gas pipelines, etc.. then State/SIA shall bear cost of cable/PLBE. But the BIDDER shall bear the cost of workmanship and other store like splicing, jointing kits etc. Below 300 mtr of damage, BIDDER will bear all the cost of restoration including material and workmanship. This clause is applicable after 3 years or after the 100% go-live whichever is later. Prior to 3years or the 100% go-live, all cost shall be bear by the bidder without any additional cost to GFGNL.

t) Prevent third party damages viz. theft or damage/s caused by other underground utility service provider.

u) Maintain condition of OFC with casing or with special arrangements near critical areas like but not limited to, major bridges, railway crossing, pipe line crossing, Forest, etc.

v) Maintenance and update of as-built drawing, information along the OFC route.

w) Maintaining history of events, analysis and reporting.

x) Public liaising with concerned authorities.

5.23.10 CAPACITY AUGMENTATION

(a) The PIA shall replace/ upgrade the SFP,Card based on the demand/ requirement during the contract period.

(b) The PIA shall provide the required spares and service support for the supplied equipment in the Project. In case of any solution/ equipment reaching End of Life (EoL)/End of Service(EoS)/End of Support during contract period, the PIA shall be responsible for its replacement with equivalent or its higher specifications/upgraded versions during the entire contract duration and subsequent extension without any financial burdern to GFFGNL.

(c) In case of installation of products / material on account of capacity augmentation or replacement / repair the same shall be subject to Preliminary acceptance testing conducted by the PIA and GFGNL. Selected PIA has to extend the onsite warranty for those newly replaced / upgraded inventories till the end of contract.

5.23.11 STANDARD PRACTICE IN O&M

The Standard Operating Procedure (SOP) in fibre fault restoration typically includes the following steps:

1. **Fault Detection**: This is usually the first step, where the system notifies the operators of a fault. Modern fibre optic systems often include automatic fault detection systems. Selected PIA has to ensure to develop the system without human interventions to detect the faults as well as the

monitoring of the asset covered under the RFP scope through either RFMS,NMS,EMS,GIS tools, Help desk system, etc.

2. **Fault Identification**: After being notified of a fault, the next step is to identify it. This can include identifying the type of fault, its location, and the equipment or part of the network element it affects. Selected bidder has to adopt the latest standard industrial practices like but not limited to use tools like visual inspection, etc.
3. **Isolation**: Once the fault has been identified, it should be isolated to prevent it from affecting other parts of the network. This could involve shutting down individual pieces of hardware or software, disconnecting certain parts of the network, or diverting traffic away from the fault. However, it should be time being and considering proactive approach, once restored same should be connect into the original conditions.
4. **Repair:** Once the fault has been identified and isolated, it is then repaired. This may involve replacing faulty equipment, repairing faulty cables, or correcting software errors.
5. **Restoration:** After the repair is completed, the part of the network affected by the fault is restored to normal operation. This usually involves turning the equipment or software back on, reconnecting any parts of the network that were disconnected, and making sure that everything is functioning correctly. Performance tests are conducted to ensure the network is up and running as it should.
6. **Documentations/Reporting and RCA(Root Clause Analysis):** After the fault is resolved, a detailed report is usually created. This report may include information about the fault, how it was detected, what steps were taken to isolate & repair it, and how the network was restored to normal operation. This report can assist in preventing similar faults in the future. Root Cause Analysis (RCA) methodology should be used to identify the fundamental origins of problems, incidents, or failures within an organization's processes, systems, or operations.
7. Selected PIA has to note, this is a general standard practices mentioned above, However, detail SOP will be shared with selected PIA once onboarded for better governance, betterment for network and organizations.

5.23.12 RESOURCE REQUIREMENT FOR FIELD OPERATIONS

Bidder is responsible for deployment of required qualified, skilled and experienced manpower defined below at the GFGNL (onsite) for the contract duration. The bidder will also be responsible for providing the sitting arrangements and other necessary provisions, such as tables, chairs, desktop/laptop as per job role,mobile,internet connectivity, and etc. to perform assigned duty for the onsite team without any cost to GFGNL. The tenderer only will be responsible for providing seating arrangement and other necessary provisions, such as tables, chairs, and internet connectivity, for the resources deployed at the State NOC (Gandhinagar).

Minimum required resources are defined below:

SN	Level	Designation	Qty	Desired Qualification	Roles & Responsibilities	Tool requirement
1	2	District Operation Manager	1 at each District	BE/BTech/Diploma plus Min. 5 years of Experience (only whole district)	Responsible for Day-to-Day operational Activities and SPOC for Technical Assistance and field engineer	Laptop
2	1	Field Engineer	1 at each block	ITI / Diploma plus Min. 3 Years of field level technical experience in telecom network operation management	Responsible for Day-to-Day operational Activities	Laptop, Hand blower, Multimeter, Power meter, Ethernet tester with minimum 10G, 100G interface/port
3	1	Technical Assistant	1 at each Sub-block or Master-block	ITI / Diploma plus Min. 2 Years of field level technical experience in telecom network operation management	Responsible for Day-to-Day operational Activities	Laptop, Hand blower, Multimeter, Power meter,
4	N/A	Fibre Restoration Team (FRT) – composition including Patroller	1 at each 250 KM	Must have relevant experience and skill sets required for fibre restoration.	Take immediate action in case of faults. Carry out repairs and restoration of the fault so as to minimize downtimes. Coordinate with various agencies and central monitoring team	Splicing Kit, OTDR, Laser Source Power meter, Vehicle GPS based tracking mechanism for FRT

SN	Level	Designation	Qty	Desired Qualification	Roles & Responsibilities	Tool requirement
					with relevant Equipment's and Tools.	
5	1	Patrollers	2 at each FRT	Must have relevant experience and skill sets required	Periodically check Fibre Route etc. and report for any anomalies found.	Vehicle, GPS based tracking mechanism

The resource quantities indicated above are indicative. The selected bidder shall deploy additional resources, at no delay to service obligations, as and when required for customer link deployment, fault rectification, and outage restoration to ensure compliance with the stipulated Service Level Agreements (SLAs) and customer satisfactions without any additional cost to GFGNL.

5.23.13 DEPLOYMENT OF FRT

Minimum Resource for One Dedicated FRT:

4-wheeler MUV/SUV for transportation of men, machines, and stores	01	T&M of FRT	01 set
Splicer	01	OTDR(1310,1550,1625nm), LSPM, Extra Cable (1Km length)	01 set
Labour	02	Splicing for Ribbon Cable/Single tube cable	01 set
Patroller with Each FRT	~~03~~ 02	Power Meter / Source Meter/High intensity laser/AFL, ETC is required	01 set
Driver /Supervisor	01	Rope, Torch, Fluorescent jacket, Safety Tools and working Tools as per requirements.	01 set

Note:1

- Manpower for surveillance, liaison, and patrolling (one man for about 70-80 kms beat). However, the bidder has to deploy extra manpower for as and when needed during any work or other agencies work in the section.
- Un-skilled manpower for trenching etc.
- Fusion splicing machines (ribbon and single fibre) with cleavers.
- Cable fault locator / Electronic locator system for armored/unarmored OFC along with roader for measurement.
- Communication Gadgets: as required.
- Tool/ Tackles kit.

Note:2

I. OFC cable locator for detecting line and depth of Underground Armored OFC cable shall be available with all the FRTs. Additionally, three healthy Cable locator should be available as spare at each zone for handling R&R (Repair and Return)

II. FRT with on wheels should have Patch chords, connectors, splicing sleeves, Joint closure (at least 3Nos), splicing machine spare battery, OTDR, LSPM tester, cable locater, Duct, OFC coil of minimum (100 Mtr), couplers, digging equipment's.

III. FRT team should also have necessary tools, emergency light tackles, splicing machine calibration cirtificates, Car driver`s valid license, insurance, car condition/health etc.

IV. GFGNL reserves the rights to sample or full audit directly or through its authorized agency to FRT team, failure to this will penalized the bidder based on the decision of the GFGNL competent authority.

V. It is essential for equipped the FRT and patroller for digital tracking at NOC of GFGNL.

VI. The FRT team needs to be deployed based on RKM to be maintained. One (01) FRT team with the composition mentioned above need to be deployed for every 250 RKM of the network under O&M.

VII. The tracking of FRT team and associated manpower as mentioned above shall be done through manpower tracking application of the FRT Team Leader provided by the PIA/ GFGNL.

VIII. The tracking of FRT team and associated manpower as mentioned above shall be done through manpower tracking application of the FRT Team Leader provided by the PIA/ BSNL.

IX. mobile and other associated hardwares, its related(other then software) recurring expenses will be born by the selected PIA. It is non-negotiable clause before submitting the claim for the O&M bills.

X. 5% of monthly O&M payment shall be deducted in case the average availability (on monthly basis) of FRT, is less than 80% of the required number of FRTs. The deduction will be 10% if the availability of FRTs is below 60% in any month.

Illustration: *Suppose, the network to be maintained is around 1000 RKM, then the number of FRT teams to be deployed shall be four (4). The FRT teams should be available for 80% on an average i.e. out of 120 FRT team-days, 96 FRT team-days shall be trackable for that month.*

If the average availability in a month is below 80% (below 96 FRT team-days), then 5% of O&M charges for the month will be deducted in addition to the SLA deductions. Further, if the average availability in a month is below 60% (below 72 FRT team-days), then 10% of O&M charges for the month will be deducted in addition to the SLA deductions.

(i) To monitor the availability of FRTs for penalty calculation as mentioned above, GFGNL shall provide mobile based GIS application to the PIAs.

(ii) In case PIA deploys its own mobile based GIS application to monitor the movement of FRTs for operation and maintenance, GFGNL may allow the integration of the same with GFGNL's GIS App for penalty calculation, eliminating the need for FRTs to update their attendance in two separate applications, if required by tenderer.

XI. In case of any issue impacting project progress and SLAs, as defined in the RFP, due to

the reasons beyond control of the PIA; the PIA shall report the same in the online message board which shall be provided by GFGNL. GFGNL & IE shall respond to the issues raised by PIA on the message board itself.

5.23.14 RESOURCE REQUIREMENT AT CENTRAL LOCATION – STATE NOC (FOR PROJECT AND O&M)

SN	Level	Designation	Qty	Desired Qualification	Roles & Responsibilities
1	3	Director - Operations	1	BE /B. Tech (EC or CS) Minimum 12/15 Years of Post Qualification Experience in large scale ICT infrastructure projects. Relevant Exp.: 8+ Years of experience as a project manager of large scale (1000 plus customer points) Telecom Projects having multiple cities/States/countries	• Overall, in-charge of Project, O&M of the complete infrastructure. • Coordinating with third party agencies and other, vendors / operators, and software/equipment's vendors. • Should be the single point contact (SPOC) for managerial responsibilities and direct interface with GFGNL. • Responsible for ensuring timely delivery of deliverables for each of the components
2	3	Dy. Director Operations (Field)	3 (each responsible for 2 zones)	BE/B.Tech/Diploma (EC/CS); 10+ years experience; 5+ years telecom project management (500+ points); one ME/M.Tech/MBA at Gandhinagar HO	• Overall, in-charge of Project, O&M of the complete infrastructure for respective Island. • He will be stationed at location where DGM Projects GFGNL will be sitting. • Should be responsible for effective Technical Resource management, System & Resource planning, based on business forecast Responsible

					for ensuring timely delivery of deliverables for each of the components.
3	2	Technical Manager cum Network Expert (IP+ Transport)	3 (each responsible for 2 Zones)	BE/B.Tech (EC)/MCA/BCA/BSC-IT/Diploma with CCNA (or equivalent Network professional level certificate) Including 7 years' experience in IP and Transport network.	• Responsible for overall management of the IT Infrastructure of the project. • Responsible for overall deployment, Integration upkeep and maintenance of all the IT components including hardware, software, Databases etc. • Responsible for end-to-end functioning and uptime of NOC and its related infrastructures
4	1	State NOC Monitors	6 (2 in each shift)	BE /B. Tech (EC/IT)/Diploma network certification 3+ Years of Post Qualification Experience in large scale (200 plus customer points) ICT infrastructure projects. Relevant Exp.: Must have an experience of managing command and control centre having multiple sub-systems	• Overall, In-charge Operation and Maintenance of NOC. • Co-ordination with various stakeholders / agencies for resolution of issues/problems etc. • Assignment of trouble ticket or incident to respective team
5	1	Network Engineers	6 (2 in each shift)	BE/B. Tech/Diploma (IT/CS/EC) with CCNA(or equivalent level certificate) or higher certification 2+ years of similar type post qualification experience	• Installation, commissioning, Troubleshooting, of all the network equipment Maintenance, Monitor & Support for network equipment • Regular update of software patches, antivirus etc. • Any other activities as and when required.
6	2	Network Solution Architect	1	· BE/BTech/ MCA degree in Electronics & Communication/Computer	• The Network Solution Architect will primarily be responsible to

				Science/Information Technology/Electrical & Electronics or Equivalent recognized by AICTE/UGC/Ministry of HRD. · Professional Experience of at least 6 years in IP-MPLS equipment installation, testing, troubleshooting etc. · He / She must be deployed within 15 days of Appointed Date.	oversee the Network Design and installation of equipment at project sites, ensuring proper configuration and functionality. He/ she will be responsible for designing traffic engineering with end-to-end configuration including their reachability to S-NOC and C-NOC for monitoring.

*For the first one year from the date of Go-live, one of the manpower should be OEM engineer. The engineer must be on the payroll of OEM payroll prior to posting for this project.

Note: Agency must use dedicated resource for this project. All proposed manpower must not be deployed other than this project.

5.24 ROLES AND FUNCTIONS OF THE IE (INDEPENDENT ENGINEER):

1). Overview of the roles of Independent Engineer:

a) Validate the high and low-level network design proposed by the PIA and recommend for approval to GFGNL.
b) Inspect the Project and report any lapses, defects or deficiencies in project implementation to GFGNL and PIA.
c) Perform acceptance testing of the network infrastructure and validate its conformance with Specification and Standards.
d) In the event of any dispute, mediate and assist GFGNL and PIA in arriving at an amicable settlement.
e) Review and validate penalties in case of PIA default during construction and O&M phase including non-compliance network performance/ SLAs and QoS parameters.
f) During handover period, validate transfer of relevant records, and reports pertaining to the Project to GFGNL.
g) Validate associated tasks required to perform with Environment, Health and Safety (EHS) compliances.

Moreover, phase-wise detailed scope of work for independent engineer is mentioned in the following sub- sections.

2). During Conditions Precedent/ Pre-Planning Phase:

Validation of fulfilment of GFGNL's and PIA's obligations during Condition Precedent (to be executed after signing of Contract Agreement). This includes the following but not limited to:

a) Review existing network handover to the PIA with respect to PIA timeline for handover.
b) Review and validate completeness of project execution and Operation & Maintenance (O&M) manual along with asset lifecycle management manuals, as required.
c) Review if PIA submit approval request to GFGNL on the use of linear architecture on case-to-case basis.

3). Planning and Design Phase:

a) Perform technical scrutiny of survey reports on GIS map.
b) Review and validate network design, upgradation proposal of existing network, initial project plan.
c) Review and validate the route diagram, route distances, ring closure, incorporation of fiberization principles, compliance with engineering guideline including EPC work and outcome, required for optical fibre cable, IP-MPLS equipment, power equipment and other accessories requirement.
d) Review and validate the adequacy of space and power requirements for passive and active network elements for GP, Block and State Network Operations Centre (S-NOC).

4). Implementation Phase:

a) Perform Material inspection for Quality and raise deviations/ discrepancies if any.
b) Validate network infrastructure deployed items such as electronics, electrical, fibre etc. as per specifications and standards and design requirements.
c) Perform audit for installation and commissioning of active equipment on site location to ensure best practices are being followed.
d) Perform acceptance tests across Gram Panchayat (GP) and route based on agreed test schedules with stakeholders.
e) Inspect and validate the integration of PIA's S-NOC (covering BharatNet existing network for upgradation and new network for creation) with BharatNet C-NOC.
f) Validate network infrastructure and issue provisional and final completion certificate to the PIA.
g) Validate closure of open punch points with PIA, in coordination with GFGNL.
h) Review and assess applicable penalty for not achieving Project milestone
i) Validate completeness of inventory / asset database records during the Construction Period
j) The Independent Engineer shall perform all other duties and functions specified in the RFP.

5) Operations and Maintenance Phase:

Validation of fulfilment of PIA's obligations during operation period. This includes obligations such as disbursement of O&M Payments and validation of network performance SLAs in conformance with project and regulatory guidelines. This includes but not limited to the following:

a) Review and assess applicable penalties for non-compliance to SLAs and QoS parameters.
b) Validate compliance over O&M obligations to support Authority on disbursement of quarterly payment as per the provision of the Contract Agreement (MSA).

c) Verify and validate completeness of inventory / asset database records during the operations period.
d) Validate and assess penalty for default on obligation of serving non-discriminatory access to BharatNet services.
e) Validate in case of PIA default during O&M phase.
f) Assess, validate and approve requirements for change request extending scope of work.
g) Six Monthly Inspection and Audit of the Network and compliance of rectification of defects/ deficiencies by the PIA.
h) The Independent Engineer shall perform all other duties and functions specified in the RFP.

Handback Phase:

Validation of fulfilment of GFGNL's and PIA's obligations in the event of termination and transfer or handover of Project.

a) Validate the inventory and Project's assets being managed and handed over by the PIA to GFGNL.
b) Validate transfer of relevant records, and reports pertaining to the Project to GFGNL.
c) The Independent Engineer shall perform all other duties and functions specified in the RFP.

Defined Timelines for timely execution of project:

SN	KPI	Timeline	Required Documentary Submission
1	Broad level technical scrutiny and design validation	within 10 days on receipt of survey report and design for all sub-blocks of the district	Copy of verified report to be submitted
2	Material inspection	Within 5 days of delivery of material / intimation by PIA or supplier	Verified dispatch certificate, signed & stamped delivery Challan. Inspection intimation by PIA/supplier
3	Review of completeness of OFC laying. Physically and on GIS	within 5 days of submission of measurement Book	Verified Measurement book, and AT report to be submitted
4	Acceptance testing at Block / GP / Other location	within 5 days of intimation by PIA.	AT report and commissioning certificate for each successfully completed Block, to be submitted
5	Inspection from S-NOC and/or C-NOC	within 5 days from intimation by PIA	AT report and verification report of S-NOC and C-NOC

Note:

I. Digital certification/workflow validation through system of GFGNL are also valid for ease of submission and single source of verification.
II. Timeline mentioned are considering working days.
III. The Timelines mentioned above are indicative and updated details can be referred from the

latest information available in IE RFP or its latest corrigendum/addendum on GFGNL /procurement website.

SECTION-6 PROJECT TIMELINES

6.1 SNOC COMPONENTS DELIVERY TIMELINES

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
T + 1 Week	**Mobilization & Initial Readiness**	• Team mobilization of asked resources under manpower of SNOC	No monitoring gap from Day-1	10% of NOC total Capex Value as per Fin.bid	0.1% of NOC total Capex Value as per Fin.bid line item 22 to 25

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
		Understanding of existing of architecture.		line 22 to 25	for delay of each week thereafter.
T + 2 Weeks	**Core NOC Platform Deployment**	• Handover of existing NOC setup including NMS, GIS of PH-I and II • Initial onboarding of available network elements	Core NOC platform ready	20% of NOC total Capex Value as per Fin.bid line 22 to 25	0.2% of NOC total Capex Value as per Fin.bid line item 22 to 25 for delay of each week thereafter
		• Installation of HCI and Leaf Switches			
		•Integration with existing infrastructure including application hosted in SDC			
T + 3 Weeks	**Basic Operationalization**	• Integration of network elements as per PH-III project (routers, OLTs, switches)	OSS becomes functional	10% of NOC total Capex Value as per Fin.bid line 22 to 25	0.3% of NOC total Capex Value as per Fin.bid line item 22 to 25 for delay of each week thereafter
		• Migration of existing data of NMS and GIS to new software to make unified network architecture			
		• Fault monitoring activated			
		• Trouble ticketing system operational			
		• Initial reporting enabled			

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
T + 4 Weeks	**Full Operational Readiness (Critical Milestone)**	•Selected PIA must submit HLD along with network architecture diagram and integration plans of unified network. - Deployment of • Asset Management tool • PM tool • Ticketing Tool • Workforce management Tool Which delivers following functionality of • SLA monitoring activated • End-to-end fault & ticket lifecycle operational • Standard dashboards and reports enabled • Basic dashboards enabled	**Fully functional NOC**	20% of NOC total Capex Value as per Fin.bid line 22 to 25	0.3% of NOC total Capex Value as per Fin.bid line item 22 to 25 for delay of each week thereafter.
T + 6 Weeks	**Integration & Service Enablement**	• Integration of all the software under single umbrella- GIS / EMS / CRM systems • Alerting and escalation workflows enabled	Integrated platform	10% of NOC total Capex Value as per Fin.bid line 22 to 25	0.08% of NOC total Capex Value as per Fin.bid line item 22 to 25 for delay of each week thereafter.

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
		• Data validation and reconciliation			
T + 8 Weeks	**Advanced Configuration & Stabilization**	• Performance tuning and optimization • Automation of SLA calculation • Dashboard customization • Historical data validation • Deployment of NMS/OSS and GIS platform on SDC environment • User creation and access control (RBAC) •For GIS Videography, readiness of cloud storage **• CNOC integration - Videography and project monitoring dashboard can be visible to CNOC**	Stable operations	5% of NOC total Capex Value as per Fin.bid line 22 to 25	0.4% of NOC total Capex Value as per Fin.bid line item 22 to 25 for delay of each week thereafter.
T + 10 Weeks	**Pre-Final Readiness**	• 10% of GP End-to-end visibility from State to field level • Reporting and SLA validation • IE acceptance preparation • Documentation readiness	Ready for acceptance	5% of NOC total Capex Value as per Fin.bid line 22 to 25	0.08% of NOC total Capex Value as per Fin.bid line item 22 to 25 item for delay of each week thereafter.

~~Timeline~~	~~Milestone Description~~	~~Deliverables~~	~~Expected Outcome~~	~~Payment Milestone~~	~~Delay Penalty~~
~~**T + 12 Weeks (90 Days)**~~	~~**Final Acceptance & Go-Live**~~	~~• Final Acceptance Testing (FAT) of S-NOC along with at least integration of 10% GPs (include integration of BharartNet Phase-I, Phase-II network)~~ ~~• SLA reporting automation~~ ~~• Training & knowledge transfer~~ ~~• Documentation & handover~~ ~~• NOC in steady-state operation~~	~~**Fully operational S-NOC within 90 days**~~	~~20% of NOC total Capex Value as per Fin.bid line 22 to 25~~	~~2% of NOC total Capex Value as per Fin.bid line item 22 to 25 item for delay of each week thereafter.~~

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
T + 2 Week	**Mobilization & Initial Readiness**	• Team mobilization of asked resources under manpower of SNOC Understanding of existing of architecture.	No monitoring gap from Day-1	10% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items (22.a to 22.g)	0.1% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter.

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
	Core NOC Platform Deployment	• Handover/takeover of existing NOC setup including NMS, GIS of PH-I and II **including existing network elements.** SITC of HCI and Leaf Switches •Integration with existing infrastructure including application hosted in SDC	Core NOC platform ready	20% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	0.2% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter
T + 6 Weeks	**Basic Operationalization**	• Integration of network elements as per PH-III project (routers, old OLTs, switches) ~~• Migration of existing data of NMS and GIS to new software to make unified network architecture monitoring including Helpdesk, trouble ticketing and SLA monitoring~~ The selected PIA shall be responsible for	OSS becomes functional	10% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	0.3% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
		seamless migration and onboarding of all existing active elements, services, configurations, alarms, performance parameters, and inventory data from the existing EMS / NMS platform(s) to the proposed EMS and NMS solution. Such migration shall be carried out without disruption to network operations and without degradation of existing SLA/KPI performance levels.			
T + 9 Weeks	**Full Operational Readiness (Critical Milestone)**	•Selected PIA must submit HLD along with network architecture diagram and integration plans of unified network. Deployment of • Asset Management tool • PM tool • Ticketing Tool • Workforce management Tool Which delivers following functionality of • SLA monitoring activated	**Fully functional NOC**	20% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	0.3% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter.

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
		• End-to-end fault & ticket lifecycle operational • Data lake/ analytics platform • Standard dashboards and reports enabled			
T + 11 Weeks	**Integration & Service Enablement**	• Integration of all the software under single umbrella GIS / EMS / CRM systems • Alerting and escalation workflows enabled • Data validation and reconciliation	Integrated platform	10% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	0.08% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter.
T + 13 Weeks	**Advanced Configuration & Stabilization**	• Performance tuning and optimization • Automation of SLA calculation • Dashboard customization • Historical data validation • Deployment of NMS/OSS and GIS platform on SDC environment • User creation and access control (RBAC) •For GIS Videography, readiness of cloud storage	Stable operations	5% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	0.4% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter.

Timeline	Milestone Description	Deliverables	Expected Outcome	Payment Milestone	Delay Penalty
		• CNOC integration - Videography and project monitoring dashboard can be visible to CNOC			
T + 15 Weeks	**Pre-Final Readiness**	• 10% of GP End-to-end visibility from State to field level • Reporting and SLA validation • IE acceptance preparation • Documentation readiness	Ready for acceptance	5% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	0.08% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter.
T + 17 Weeks (~~120~~ 119 Days)	**Final Acceptance & Go-Live**	• Final Acceptance Testing (FAT) of S-NOC along with at least integration of 10% GPs (include integration of BharartNet Phase-I, Phase-II network) • SLA reporting automation • Training & knowledge transfer • Documentation & handover • NOC in steady-state operation	**Fully operational S-NOC within ~~120~~ 119 days**	20% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g)	2% of NOC total Capex Value as per Eligible Fin.bid S-NOC line items(22.a to 22.g) for delay of each week thereafter.

Note: Max penalty cap of 20% of NOC total Capex Value as per Fin.bid line item 22 (a) to 22(g) ~~25~~ . However, withholding of milestone payments shall remain applicable until successful completion and acceptance of deliverables.
Illustration:
Capex Amount=1000
Max Penalty= 200 @20%

Timeline	Delay (Weeks)	Payment Held (Rs)	Penalty / Week (Rs)	Stage Penalty (Rs)	Cumulative Penalty (Rs)
T+1	2	100	1	2	2
T+2	3	300	2	6	8
T+3	4	400	3	12	20
T+4	5	600	3	15	35
T+6	6	700	0.8	4.8	39.8
T+8	7	750	4	28	67.8
T+10	7	800	0.8	5.6	73.4
T+12	8	1000	20	160	233.4 → capped at ₹200

Note:
Successful Bidder shall take the handover of the existing system as is where is basis as per NOC delivery timeline, it is bidder's responsibility to migrate the existing system to new single platform for better monitoring performance parameter of existing and new network devices.Sizing and other inventories details are available in related annexures of the master RFP.

6.2 PROJECT TIMELINES

Milestone Number	Completion Timeline	GPs Deliverable	Remarks For Evidance Document/Report
I	T0+ 180 Days	Aggregate commissioning of 12% GPs in a ring visible on the S-NOC / validated through C-NOC using EMS with IP-MPLS	Visibility report of GP Ring from EMS/NMS of Central NOC, and digital asbuilt diagram update in GFGNL GIS(ISP/OSP inventory), Monthly Progress Report
II	T0+360 Days	Aggregate commissioning of 40% GPs Phase-I in a ring visible on the S-NOC / validated through C-NOC using EMS with IP-MPLS	As Above
III	T0+540 Days	Aggregate commissioning of 60% GPs in a ring visible on the S-NOC / validated through	As Above

		C-NOC using EMS with IP-MPLS	
IV	T0+720 Days	Aggregate commissioning of 80% GPs in a ring visible on the S-NOC / validated through C-NOC using EMS with IP-MPLS	As Above
V	T0+ 900 Days	Aggregate commissioning of 100% GPs in a ring visible on the S-NOC / or validated through C-NOC using EMS with IP-MPLS	As Above

Table 6.1

Note:

1. T0 is the date of the appointed date or from the date of FWO issued by GFGNL, whichever is later.
2. First two months will be for Man and Material Mobilization, and selected PIA is solely responsible to submit , PIA should apply for ROW permissions during this period as per the Approved Route Plans and submit the valid proof /evidence reports to the GFGNL.
3. The prospective bidders should conduct a detailed site survey during the bidding stage.
4. Non-adherence to the aforementioned timelines/milestones shall attract penalty.
5. Above counts are indicative and notional value which include the revenue villages. It may very based on actual.
6. Non-adherence to the aforementioned timelines/milestones shall attract penalty.

6.3 SCHEDULED COMPLETION DATE

i. After all the Blocks are declared commissioned, after the Project Milestone (Commissioning of individual rings and not less than 95% GPs should be visible in S-NOC and C-NOC), the Schedule Completion Date shall be the 870th (Eighthundred Seventieth) day (29th Month) from the Appointed Date.

ii. Project Completion shall include complete integration of all equipment with EMS/ S-NOC & C-NOC along with updation of all the necessary documents (Licenses/ Manuals/ OEM agreements and support, Commissioning memo's & AT reports, operations/ maintenance & safety instructions etc.) and of all the assets in C-NOC after installation and commissioning of all the rings & S-NOC with minimum 99% of the total numbers of GPs in the project as envisaged in the tender.

iii. Delay in project completion shall attract the penalty as per LD clause. However, as per field requirements, project can be extended or short closed for the left-over GPs.

6.4 PAYMENT SCHEDULE OF PROJECT/ PAYMENT OF BID PROJECT COST

Upon receiving request from PIA, GFGNL on behalf of DBN, DoT shall make an advance payment (the "Advance Payment"), upto 10% (ten percent) of the capex value of the bid Project Cost, for mobilisation expenses and for acquisition of equipment.

a) Mobilization Advance will be non-interest bearing for the specified term.

b) The PIA shall submit an additional Bank Guarantee of 110% of the Mobilization Advance valid up to 60 days after the Construction Completion Date.

c) Initial Mobilization advance upto 10% of the capex value shall be adjusted in 8 (eight) equal quarterly instalments. The first instalment shall be adjusted in the 9th month (from the month of disbursement of the advance) from the due payments, second instalment in the 12th month, 3rd instalment in the 15th month and so on. The PIA can avail, a further Mobilization Advance of up to 5% (five percent) of the capex value of the bid project cost, on the Completion of Project Milestones II. The second mobilization advance shall be adjusted in 6 (six) equal quarterly instalments starting from 6th month from the date of disbursal of the advance. Similarly, further third Mobilization Advance of up to 5% (five percent) of the capex value of the bid project cost may be additionally availed, after the completion of Project Milestones IV. The third mobilization advance shall be adjusted in 4 (four) equal quarterly instalments starting from 4th month from the date of disbursal of the advance. However, on completion of the last milestone, 100% advance pending will be adjusted in the invoices to be paid. In case of delayed adjustment of mobilization advance due to non-completion of Project completion Milestones (including grace period), penal interest shall be charged for the delayed period @ SBI MCLR rate per Annum. In case of non- completion of work, penal interest shall be charged for the entire period starting from the date of disbursal of such advance till the date of adjustment/ deposit with GFGNL. For Mobilization Advance taken with GST, the amount of GST shall be returned/ adjusted in full by the PIA within 18 months from date of disbursal of advance, or the milestones due within 18 months; whichever is earlier.

Note: The mobilisation advance recovery schedule specified in the RFP shall apply as defined. In the event of short-closure, termination, reduction in scope, or completion prior to full recovery, any outstanding mobilisation advance shall be recoverable by GFGNL in accordance with the provisions of the RFP, including adjustment against pending payments and available securities. Existing RFP provisions remain unchanged.

d) In case of non-adjustment of advance, in the prescribed period, the PIA will deposit the payable amount in next 30 days with interest, otherwise GFGNL on behalf of DBN, DoT reserves the right to invoke the PBG for recovery of principal and interest.

e) The PIA can request for mobilization advance after signing of the agreement between GFGNL (on behalf of DBN, DoT) and PIA.

f) Bid Project Cost shall be due and payable to the PIA in installments during the Development Period

g) Upon receiving the invoices after completion of works as under from the PIA, duly certified by the Independent Engineer, GFGNL shall disburse, within 45 (forty five) days of the receipt of each such invoice, installments as mentioned below:

h) For GPs planned in a Ring:

S. No.	Milestone	% of Payment	% of Cumulative Payments
1a	Commissioning of electronic equipment (router) at Sub-Block including master-block(co-located sub-block) (visible in S NoC or validated through C-NOC by IP ping)	75%@ of Sub-Block equipment cost	-
1b	Commissioning of electronic equipment (router) at GP* (visible in S NoC or validated through C-NOC by IP ping)	75%@ of GP equipment cost	
2	Commissioning of at least 90% electronic equipment (router) of a ring (at least 90% GPs including Sub-Block to sub-block in a ring) (visible in SNoC or validated through C-NOC by IP ping)	5% of equipment cost (sub-Block and GP)	-
3	Commissioning of individual rings as specified in Sl No. 2 (visible in S NoC or validated through C-NOC using eMS) **	80% of OFC construction cost***	80%
4	90% GPs of respective Sub-Block visible in S-NOC including master-block(co-located sub-block)	10% of equipment and OFC construction cost	90%
5	At-least 90% GPs of 90% Sub-Blocks are completed (visible in S NoC)	5% of OFC construction cost	95% of OFC construction cost + equipment cost as per Note-iv below
6	Completion of project with or without short closure	5% of OFC construction cost #	100% of OFC construction cost + equipment cost as per Note-iv below

* GP shall be considered commissioned only when corresponding sub-block and master block has already been commissioned.

**PIA can claim, payment of 80% of milestone 3 above for OFC construction as per actual completed portion (node to node) for the ring in a block in case the ring is not completed due to reasons beyond the control of PIA like issues from State Government (including RoW), provided all the GPs are up & in working condition and number of such GPs (working but not in ring) is less than 20% of the total required GPs against the payment milestone.

*** including the claimed amount of OFC construction, if any.

Except for equipment mentioned in note iv below.

@ 75% CAPEX payment linked to the commissioning milestone (S-NOC visibility or C-NOC IP ping), subject to submission of complete documents, verification, and certification by IE/designated authority.

Note:

i. PIA shall raise an invoice in the name of GFGNL/DBN, DoT on monthly basis for the completed work.

ii. Payment of the above-mentioned milestones shall be done in the sequential order.

iii. The payment against milestone 2 and 3 for the GPs planned in spur shall be released by considering such GPs as part of the ring.

iv. The 10% payment of all the electronic items namely- Router at GP,Mini-OLT,FSO(if applicable) at GP, Router at Block, all the equipment at State NOC, RFMS, the Racks, UPS/Power Plant, Battery, as specified at Price Schedule in the table of pre-defined rates, shall be made on completion of warranty of one year for these equipment.

(Note: The 10% amount for electronic items shall be released upon completion of the initial warranty period of one (1) year, as defined above.

The extended support/maintenance obligations under the remaining contract duration shall be governed separately under O&M provisions and SLA commitments, i.e.,in Clause 4.28: -i(5)- A comprehensive on-site warranty and Operations & Maintenance on all goods supplied under this contract shall be provided by the respective Original Equipment Manufacturer (OEM) through PIA till the end of the Contract)

v. All payments shall be released after certification of Delivery and Implementation Milestones by GFGNL.

vi. Since the project timelines are of utmost importance, DoT shall reserve the right to take over the project implementation, in case of the project milestones delayed by over 60 days of its agreed time. In this regard, the decision of the Empowered Committee shall be final and binding.

vii. All Payments shall be made in Indian Rupees Only.

viii. All field work and invoice process to be validated by IE/ GFGNL authorized agency.

ix. Payment shall be released by the Tenderer against the invoices raised by PIA within ~~30~~ 45 calendar days on providing all the relevant documents timely and are complete in all reference.

x. Payments should be subject to deductions of any amount for which the PIA is liable under the RFP conditions. Further, all payments shall be made subject to deduction of TDS (Tax deduction at Source) as per the current Income-Tax Act.

xi. The TENDERER/its authorized agency shall certify actual implementation . The PIA has to ensure proper handholding & support of the system.

xii. PIA shall raise the component wise invoice as per the milestones achieved as mentioned above in the payment schedule & submit the invoice to TENDERER.

xiii. TENDERER shall verify the Invoice raised against the milestone achieved & shall make the payment after deduction of penalty, if any.

xiv. The PIA's request(s) for payment shall be made to TENDERER along with the 2 original copies of invoice and necessary documents. The invoice should be in English language and Gujarat based.

xv. Payment shall be made in Indian Rupees. While making payment, necessary income tax and service tax deductions will be made.

xvi. The commissioning of GP/Sub-block/Master Block router shall be considered complete either through the equipment is successfully visible/operational in S-NOC, or , The equipment is validated through C-NOC via successful IP ping response. the completion shall be established based on verifiable system validation records and process define in consultation with IE.However, Both conditions are independent and achievement of any one of the above shall qualify for milestone completion.The completion shall be established based on verifiable system validation (S-NOC visibility or C-NOC IP ping logs).Any malpractice or incorrect reporting by the bidder shall attract appropriate contractual action, including but not limited to any or all of the following options like financial implications, forfeiture of PBG, or termination, as per RFP provisions.

6.5 O&M PAYMENTS:

I. All O&M Expenses in the form of quarterly payments shall be due and payable by GFGNL on behalf of DBN, DoT , as per the yearly O&M Cost as under , Similarly for existing fiber on lease , the O&M payment is already clubbed in the quarterly payments , thus any O&M Expenses in excess of such O&M (incase of PIA constructed fiber) or quarterly (for fiber on lease) payments shall be borne solely by the PIA. For avoidance of doubt, it is clarified that the quarterly payments for such fiber on lease and PIA constructed fiber will be treated separately being on different routes , thus the quantity under the scope of PIA shall be as per actual only and no overlapping , of fiber on lease and fiber construction by PIA , will be allowed on any route .

II. O&M payment will be paid GP wise after completion of every quarter, based on the SLAs (averaged over a block(Sub, Master Block), counting only GPs under AMC) during the O&M phase. The O&M charges shall be worked out as a fixed percentage of CAPEX for a particular financial year. For the

existing OFC network, notional CAPEX shall be worked out based on the RKM length of the taken over OFC network by the PIA multiplied by the rates as mentioned in the AWO, as below:

(a) for 24F OFC: Unit Price of item at S. No.- 1a of the Price Schedule of RFP (marked as 'A').

(b) for 48F OFC: Unit Price of item at S. No.- 1b of the Price Schedule of RFP (i.e. 1.1 times of 'A').

(c) for 96F OFC: Unit Price of item at S. No.- 1c of the Price Schedule of RFP (i.e. 1.1 times of 'A').

(d) for 288F OFC: 1.35 times the cost of 24F OFC (mentioned at (a) above

NOTE: The damaged routes shall not be considered for calculation of AMC and AMC payment on notional CAPEX basis.

III. **O&M cost during Project execution Phase:**Any section which is in damaged condition or temporarily restored shall be clearly mentioned in the HOTO memo. For permanent restoration of such damaged sections/ temporary restored sections, the PIA shall be paid as Rs. 351/-(Including Taxes) per GP per day for Phase-I and Phase-II as a part of O&M payment on or before the GP visibility in the NMS in ring or as per the terms and conditions mentioned in the RFP for migration on IPMPLS technology. The rate mentioned above will be applicable till the 100% go-live or the three years of project time line whichever is earlier.

a) The O&M cost per GP (for network having equipment under warranty) for a quarter shall be worked out as under-

   i. [CAPEX of the commissioned works as rate mentioned in above table including electronic items under warranty out of items as mentioned in Note-iv of payment criteria above) as on the last day of the previous quarter **+** notional CAPEX of the made over OFC network] **/** No. of GPs under O&M on the first day of the quarter * R[year wise as per payment critieria below].

b) After the completion of warranty of 1 year for the electronics items (as mentioned in Note-iv of Para-12.1.h above), the O&M cost for those GPs where the warranty is already over, the O&M cost shall be worked out as under-

   i. [CAPEX of the commissioned works as on the last day of the previous quarter **+** notional CAPEX of the made over OFC network] **/** No. of GPs under O&M on the first day of the quarter * R[year wise as per Para-13.5 below]

IV. **O&M Rate (Year wise):** Percentage O&M rate for the year after commissioning shall be as per below table. Year 1 in the table below shall be financial year in which the first ring is commissioned. Year 2 shall be next financial year and so on.

Year	1	2	3	4	5	6	7	8	9	10
OPEX to be paid as % of the CAPEX /notional CAPEX (R)	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	**6.5**	**6.5**	**6.5**	**6.5**	**6.5**

NOTE:

Beyond 10th year, the equipment which is not EoSL (End of Support Life), can be continued along with the network for O&M as per decision of DBN / GFGNL and also with the consensus of PIA. The OPEX payable after 10th year will be enhanced annually by 4% (i.e. 11th year will have OPEX of 6.76%, 12th year will be 7.02% and so on) till the continuity of the O&M of the network by PIA.

a. Further, with regards to the payment of O&M Payments to the PIA, GFGNL shall pay 50%(Fifty percent) of the invoice amount within 45 (forty five) days of receiving a demand from the PIA along with invoice and necessary particulars. Remaining 50%(Fifty percent) payment shall be made to the PIA by GFGNL after due audit / verification, within 90 days of receiving a demand from the PIA along with invoice and necessary particulars.

b. The PIA shall be responsible for O&M of the made over GPON network, comprehensive O&M of OFC network, MPLS network, associated infrastructure.
The PIA shall be paid, for such all type (without limit of OFC length / lossy ofc) replacement of damaged sections . PIA may coordinate for raising demands from agencies requiring shifting of cables, if applicable, before taking approval for such replacement of damaged sections. In such case, the PIA will also be required to restore the GP using OH OFC on temporary basis within 12 Hrs, else, SLA penalty will be applicable.

c. The PIA shall identify and notify the sections of made over OFC network which have become lossy and need replacement during the contract period to the IE/GFGNL for replacement.In such cases also, the PIA will also be required to restore the GP using OH OFC on temporary basis within 12 Hrs, else, SLA penalty will be applicable.However, PIA will be solely responsible for permanent restoration with same type and gauge of OFC without any additional cost to GFGNL/DBN.

d. Further, the existing inventory matrix of shelter infrastructure mentioned annexure. The selected bidder shall be required to provide comprehensive Annual Maintenance Contract (AMC) support for the shelter infrastructure line items or the bidder may replace the existing inventory through an agreed and suitable mechanismwithout additional cost to GFGNL. In all cases, the bidder must ensure strict adherence to the defined Service Level Agreements (SLAs) and Key Performance Indicators (KPIs).For existing Shelter inventories O&M will be paid extra Comprehensive Charges for Operation & Maintenance of the shelter Infrasturcture site with rate of Rs. 6000/- per site per month(excluding Taxes).

e. For the cases involving construction of new shelters or upgradation of existing shelters using the specified line items, subject to consultation with and approval from GFGNL/IE, the year-wise O&M rates, specified under Clause 4 shall be applicable, on the discovered prices of the corresponding financial line items under this RFP (namely, Line Items 26a to 26x).

Note:

(1) In case any associated component is required not covered in the BoM, PIA shall provide the same to complete the work without any extra cost.

(2) The PIA shall be required to follow the Technical Specification-Section 10 & Testing Parameters as mentioned in **Annexure A**, **Annexure-B, Engineering Instructions (EI) (Annexure C) and Annexure D.**

(3) Any deviation from the standard EI, shall be liable for penalty as per clause 6 & 11.

(4) In case there are any changes in the standard engineering instructions, PIA may be asked to execute the work as per the latest engineering instructions.

(5) During the process of execution, the PIA shall be responsible for resolving all the disputes arising out of damages caused to the public utilities and infrastructure of private operators/ public including payment of compensation, if any.

6.6 QUALITY ASSURANCE AND TESTING

6.6.1 Indigenous Equipment:

a. The supply of Equipment manufactured indigenously shall be accepted only after Quality Assurance tests are carried out by the IE/ any other agency nominated by GFGNL, as mentioned in below. For other items which do not have TEC GR, QA shall be done based on a test schedule submitted by the Successful Bidder and approved by GFGNL/IE. However, for branded IT items such as computers, laptops, servers and computer peripherals that are supplied by ISO certified companies, GFGNL/IE, at its discretion, may accept the testing and quality certificate of such companies in lieu of QA requirements and copy of the same shall be submitted to the GFGNL Head at the time of supply of these Equipment and to the Inspection Circle for verification while offering for acceptance testing. The relaxation of QA requirement, if necessary, shall be given by GFGNL on a case-to-case basis.

b. In case of supply of Indigenous equipment, for Routers to be installed at Blocks & GPs and RFMS, the Bulk QA testing shall be carried out, as under:

i. If the actual supply experience is up to 5 times the maximum supply experience, required for eligibility criteria, as per the certificate provided in accordance with eligibility criteria (*as per clause-, in case of Class-I & Class-II local suppliers*), the Bulk QA testing shall be done on 20% of the quantity to be supplied. Similarly, if the actual supply experience is between 5 to 7 times the maximum supply experience, required for eligibility criteria, Bulk QA testing shall be done on 10% of the quantity to be supplied and if the actual supply experience is more than 7 times the maximum supply experience, required for eligibility criteria, Bulk QA testing shall be done on 5% of the quantity to be supplied. *{see illustration-1, below}*

I. In case of failure of any component during the Bulk QA testing-

(a) Complete lot shall be deemed as rejected. The same lot shall be offered again for Bulk QA testing by the concerned OEM.

(b) The offered quantity shall be equal to that of the rejected lot. For such re-offered

lot (post rejection), Bulk QA testing shall be done on the 100% offered quantity.

(c) For all the further offered lots (post rejected lot), Bulk QA testing shall be done on the 10% more quantity than the prescribed quantity as in sub-clause-(i) above (i.e. 20%, 10% or 5%, as the case may be).

(d) As mentioned at para- (a) & (b) above, for all the re-offered lot (post rejection), Bulk QA testing shall be done on 100% offered quantity.

(e) After each rejected lot, Bulk QA testing shall be done on 10% more quantity than the previous successfully tested lot, as mentioned at para- (c) above.

{see illustration-2 below}

II. The PIA/ respective OEM shall make the suitable arrangements in India for such Bulk QA testing of such imported items.

6.6.2 Imported Equipment:

a) The supply of imported equipment (except Block & GP Routers and RFMS) shall be accepted only if it is accompanied with Factory Test Reports (FTR)/ certifications of various performance parameters required as per relevant TEC GR & Technical Specifications mentioned in this tender together with environmental test as per BSNL QA document QM333 with bulk testing certificate from QA, BSNL. Any imported equipment not accompanied by the Factory Test Reports/ certifications of various services, features, facilities and performance parameters as per relevant TEC GR & Technical Specifications in RFP together with environmental testing certificate as per QA document QM-333 shall not be accepted. For the IT equipment such as Routers (except Block & GP Routers and RFMS), servers etc. supplied by ISO certified companies, the PIA shall seek for any specific relaxation, if necessary, along with reasons, on QM333 requirements from QA Circle before supplies are made which will be considered by QA circle and decision of the same will be binding. The Factory Test Reports and certification with relaxed parameters are to be submitted along with the supplies.

b) In case of supply of imported items, in addition to FTR as mentioned, the bulk testing shall also be required. For Routers to be installed at Blocks & GPs and RFMS, the Bulk QA testing shall be carried out, as under:

I. If the actual supply experience is up to 5 times the maximum supply experience, required for eligibility criteria, as per the certificate provided in accordance with clause-4.78, the Bulk QA testing shall be done on 20% of the quantity to be supplied. Similarly, If the actual supply experience is between 5 to 7 times the maximum supply experience, required for eligibility criteria, Bulk QA testing shall be done on 10% of the quantity to be supplied and if the actual supply experience is more than 7 times the maximum supply experience, required for eligibility criteria, Bulk QA testing shall be done on 5% of the quantity to be supplied. *{see illustration-1, below}*

II. In case of failure of any component during the Bulk QA testing-

(a) Complete lot shall be deemed as rejected. The same lot shall be offered

again for Bulk QA testing by the concerned OEM.

(b) The offered quantity shall be equal to that of the rejected lot. For such re-offered lot (post rejection), Bulk QA testing shall be done on the 100% offered quantity.

(c) For all the further offered lots (post rejected lot), Bulk QA testing shall be done on the 10% more quantity than the prescribed quantity as in sub-clause-(i) above (i.e. 20%, 10% or 5%, as the case may be).

(d) As mentioned at para- (a) & (b) above, for all the re-offered lot (post rejection), Bulk QA testing shall be done on 100% offered quantity.

(e) After each rejected lot, Bulk QA testing shall be done on 10% more quantity than the previous successfully tested lot, as mentioned at para- (c) above.*{see illustration-2 below}*

III. The PIA/ respective OEM shall make the suitable arrangements in India for such Bulk QA testing of such imported items.

Illustration-1: *If the requirement is 2,500 routers against which the bid has been submitted by a bidder. Thus, the required experience is of (30%) routers as per clause 2.11.(i) of Section-IV-A (or 10% as per clause- 2.11.(ii), in case of Class-I & Class-II local suppliers). For any OEM, having actual supply experience up to 3,750 routers, as per the experience certificate(s); the Bulk QA testing shall be done on 20% of the quantity to be supplied i.e. 500 routers. Similarly, for an OEM with actual supply experience of 3,750 to 5,250; the Bulk QA testing shall be done on 250 routers and; for an OEM with actual supply experience of more than 5,250, the Bulk QA testing shall be done on 125 routers*.

Illustration-2: *An OEM qualify (as per actual experience and required supply) for 20% Bulk QA testing and equipment is to be offered in 10 lots. If the 3rd lot is rejected, the same lot shall be re-offered and 100% quantity shall be tested for Bulk QA. For 4th lot onwards, Bulk QA testing shall be carried out on 30% of offered quantity. Further, if 7th lot is rejected, 100% quantity of re-offered 7th lot shall be tested. For 8th lot onwards, Bulk QA testing shall be carried out on 40% of offered quantity and so on.*

c) The supply of equipment/stores/services shall strictly adhere to the package discipline as described in the Purchase/Work Order. A particular item mentioned in SoR would deem to have been received in full only if all the parts/ components, installation material etc. are supplied as a package during Scheduled Delivery Period.

d) All equipment supplied shall be new products only and no refurbished equipment shall be supplied in any case.

e) In case of any Quality issue, the PIA shall be required to replace the defective/inferior material, in full, by good material duly passed by QA.

f) A quality manual describing the QA system shall be submitted along with the bid, which should

include the details about the component quality assurance and quality system practices, including data on critical components.

g) The PIA shall obtain approval from GFGNL Office for all the passive items to be supplied under the contract (MAF and TSEC/ QF-103 for passive items are not required to be submitted along with bid). The bidder shall submit a request enclosed with valid MAF (in the format as per tender) and copy of TSEC to GFGNL for approval of an OEM.

h) **QA Charges**: The PIA shall get the QA done for all the material to be used for which specifications have been defined.

i) TSEC of imported items shall be done as per the IE/ any other agency nominated by GFGNL prevailing guidelines on QA for imported items.

j) The PIA shall have valid Type Approval Certificate (TAC) from Telecom Engineering Centre (TEC), New Delhi or Technical Specification Evaluation Certificate (TSEC) from Quality Assurance Circle, BSNL, Bengaluru, against the respective technical specifications of this RFP, before commencement of the supply. The requirement of TSEC for various items to be used for execution of the project are mentioned in the Table below:

S. No.	Material name	TSEC (Required/ Not Required)
1	24F loose tube type armoured optical fibre cable	Required
2	48F ribbon type armoured optical fibre cable	Required
3	PLB HDPE telecom duct (40/33mm)	Required
4	24F Metal Free Aerial Optical Fibre Cable (24F ADSS)	Required
5	Joint Enclosure (48F and above)	Required
6	SJC/BJC (24F)	Required
7	Fibre Distribution Management System Type I at Block location	Required
8	Fibre Termination Box/FDMS Type-IIIA & IIIB – 48F at GP locations	Required
9	Rack at Block locations	Required
10	Rack at GP locations	Required
11	IP-MPLS Router at Block location	Required
12	IP-MPLS Router at GP location with accessories	Required
13	Remote Fibre Monitoring System (RFMS) including necessary hardware and software with accessories provision of MPPT Card	Required
14	Power System with backup provisions at GP locations with	Required
15	Power System with backup provisions at GP locations with provision of slot for MPPT Card BUT excluding MPPT Card & solar panels	Required
~~16~~	~~Lithium-Ion Battery of 2400 VAH to be used~~	~~Required~~
17	Installation Accessories and fixtures of Self-Supporting Metal free Optical Fibre Cable	Required
18	Poles for ADSS Fiber Laying	Not Required
19	Route/Joint indicators	Not Required

S. No.	Material name	TSEC (Required/ Not Required)
20	SFP 100G (with 40km / 80km) pluggable	Not Required
21	SFP 10G (with 10km/40km/80km) pluggable	Not Required
22	SFP 1G with 10km pluggable	Not Required
23	SFP 10G with 10Km pluggable	Not Required
24	SFP 1G with 10 km pluggable	Not Required
25	~~Civil works including site preparation and partitioning works , false flooring, false ceiling, etc.~~	Not Required
26	Electrical works including light fixtures, cabling, panels + earthing etc.	Not Required
27	Silent DG set with AMF panel	Not Required
28	~~Air conditioning for NOC, UPS, BMS, Meeting, electrical rooms, etc.~~	Not Required
29	~~40 kVA online UPS (with SNMP)~~	Not Required
30	~~Access Control System (RFID + Biometric, smart cards)~~	~~Not Required~~
31	Racks (Integrated Air conditioning and climate monitoring system covering entire Racks/suite/Isle/Data Centre only)	Not Required
~~32~~	~~IP camera with intelligent monitoring system including software & internal storage~~	~~Not Required~~
33	70" LED TV	Not Required
34	Structured cabling (OFC and Cat6)	Not Required
35	Workstation furniture and fixtures including chairs	Not Required
36	Fire Detection System	Not Required
~~37~~	~~NOC Router~~	~~Not Required~~
~~38~~	~~Core Switch~~	~~Not Required~~
39	Access Switch	Not Required
40	Aggregation Switch	Not Required
41	Primary SAN storage for application & DB	Not Required
42	SAN Switch	Not Required
43	Secondary Storage (As per requirement, to be assessed by PIA)	Not Required
44	Blade Chassis/Rack servers (including AAA*) (As per requirement, to be assessed by PIA)	Not Required
45	Workstation computers (i5 2.5 GHz processor, 8 GB DDR4, 1 TB HDD with 19.5 Full HD Monitor Key Board & Mouse with all other accessories as per requirement; 1xDVI output, 2xHDMI Output, 1xVGA Output)	Not Required
46	~~IP phones~~	Not Required
47	~~IP PBX~~	Not Required
48	Video wall display, Controller, Video wall Management Software & Accessories	Not Required
49	Backup and archival solution	Not Required
50	NMS/OSS Solution	Not Required
51	Helpdesk solution	Not Required
~~52~~	~~End point protection software~~	~~Not Required~~
~~53~~	~~Centralized Access Control system software~~	~~Not Required~~

NOTE: If any item is not covered in the table above, the TSEC applicability shall be ~~decided by GFGNL,~~ as per prevalent guidelines mentioned in the BharatNet project guidelines.

*Providing AAA server will be out of scope for the bidder, However, if needed providing end to end integration with GFGNL network will be responsibility of the selected bidder.

6.7 DEFINITION OF 100%GO-LIVE

i) **100% Go-live:**

a) Clearing all observations come from during field observations, customer feedback, IE/TPA/GFGNL authorized agency's etc.

b) All links network topology on dual home ring with trace of adjacent physical neighbor nodes with confirmation on GFGNL SNOC/CNOC.

c) If Sub-block level atleast 90% of GP live in ring then it will be considered as sub-block 100% go-live. Aggregate count of GP at Sub-Block will be considered at once for the cases of dual home network architecture,i.e., the other side of block GP ring will not be considered.

d) Completion of Field AT and submission of all valid documentations mentioned above and asked in this RFP.

e) All payments shall be released after certification of Delivery and Implementation Milestones by GFGNL official and/or Appointed agency from GFGNL.

Note:

I. Prior to fully 100% go-live ownership of existing assets will be responsibility of the bidder including the any OFC rectifications or OFC shifting or OFC replacement due to row change, any third-party damage, etc.

II. Once the 100% go-live is declared and once the GP entered in O&M phase, the only discovered rate of O&M will be applicable.

III. Bidder should note that different GPs will be lit at different times as per the timeline for project implementation.

IV. GFGNL shall be entitled to withhold the payment of a disputed invoice or part of it delivered by the PIA, when GFGNL disputes such invoice, or part of it, provided that such dispute is bonafide.

V. Bidder will be responsible to submit the all required valid documentations to smooth payment for O&M billing like but not limited to warranty, MAF, Digital As-built, Photo's as per ask in videography section, clearance of any open/punch point during implementations, acceptance test, synthetic traffic report, etc. Failure to this will invite penalty to bidder and PIA has to adhere to it. GFGNL authority's decision will be consider as final.

Note - Any GPs cannot be commissioned due to reasons beyond the control of the PIA, such as ROW issues, statutory approvals, utility constraints, customer dependencies, or other external factors, the same shall be considered by GFGNL on a case-to-case basis subject to submission of adequate documentary evidence and verification by the IE/GFGNL.Other terms and conditions shal remain as per the RFP. However, Based on the actual integrated GPs only applicable for payment based on valid document proof.the PIA shall continue to pursue resolution of such dependencies and complete the pending GPs.

SECTION-7 SERVICE LEVEL AGREEMENT(SLA) & PENALTY

The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service, which shall be provided by the PIA to tenderer for the duration of the contract for providing Applications, Operation and Maintenance support against the stated scope of work. Tenderer shall regularly review the performance of the services being provided by the SP and the effectiveness of this SLA.

7.1 DEFINITIONS OF SLAS

For purposes of this Service Level Agreement, the definitions and terms as specified in the contract along with the following terms shall have the meanings as set forth below:

a. "Incident" refers to any event / abnormalities in the functioning of TENDERER specified services that may lead to disruption in normal operations of TENDERER services.

b. "Response Time" shall mean the time taken after the incident has been reported at the concerned reporting center in resolving (diagnosing, troubleshooting and fixing) or escalating to (the second level, getting the confirmatory details about the same and conveying the same to the end user), the services related troubles during the first level escalation.

c. The resolution time: the resolution time is the time taken for resolution of the problem and this includes provisioning of the work around to immediately recover the situation. The resolution time shall vary based on the severity of the incident reported.

7.2 CATEGORIES OF SLAs

This SLA document provides for minimum level of services required as per contractual obligations based on performance indicators and measurements thereof. The PIA shall ensure provisioning of all required services while monitoring the performance of the same to effectively comply with the performance levels. The services provided by the PIA shall be reviewed by TENDERER against this SLA. The PIA shall:

- Discuss escalated problems, new issues and matters still outstanding for resolution.
- Review of statistics related to rectification of outstanding faults and agreed changes.
- Obtain suggestions for changes to improve the service levels.

The following measurements and targets shall be used to track and report performance on a regular basis. The targets shown in the following table are applicable for the duration of the contract.

7.3 CONSTRUCTION PHASE

(i) All the Gram Panchayats (GPs) should be connected as per the scope of work defined and Project Completion Schedule. The Penalties applicable for not meeting the Milestones are as below:

(ii) Should the PIA fail to achieve the defined Project Milestone within the period prescribed clause in above section, GFGNL, without prejudice to other remedies available to it shall be entitled to recover, as agreed, liquidated damages (LD) as follows:

a) at a sum equivalent to 0.5% of the value of incomplete GPs as per milestone for each week of delay or part thereof for a period up to 10 (TEN) weeks, and thereafter

b) at the rate of 0.7% of the value of the incomplete GPs as per milestone for each week of delay or part thereof for another 10 (TEN) weeks of delay. (LD is capped at 12% of ~~package~~ Project cost).

c) The Value of incomplete GP for the purpose of calculation of LD shall be taken as equal to the Total Project Cost (PO Value excluding O&M charges) divided by the number of GPs as per SOR.

d) **L.D. on subcontracted works**: If the achievement of a milestone is delayed due to any sub-contracted work, the applicable penalties/ LD shall be twice the penalties mentioned in Section 7.3. (LD is capped at 24% of ~~package~~ Project cost).

(iii) Non-completion of the targets of any Project Milestone even at the occurrence of the next Project Milestone shall render the PIA liable to any or all of the following sanctions:

a) Forfeiture of its performance security,

b) Imposition of penalty, and/ or

c) Short- closure of the contract in part or full and/ or termination of the contract for default.

(iv) For the Project Milestone-I only , the project milestone period (180 days, as per RFP) shall be up to 180 days from the appointed date or up to 120 days from the date of FWO issued by GFGNL, whichever is later.

(v) There will be a relaxation in the penalty/ L.D. during construction phase only in terms of grace period according to the achievements up to a certain extent, as mentioned below:

(a) **For Project Milestone-I only**: If the PIA has completed 90% work against Project Milestone-I within the assigned timelines as per tender, there will be a grace period of 60 days for remaining work i.e. up to 10% of the 1st milestone. There will be no penalty during this grace period of 60 days for Project Milestone-I. In case, incomplete work is more than 10% of target, the grace period shall not be available and the Liquidated Damages shall be applicable as per tender.

(b) There will be a further extended grace period of 30 days (beyond 60 days grace period) if only up to 5% work against 1st milestone is incomplete. In case, incomplete work is more than 5% of target, the extended grace period shall not be available and the Liquidated Damages shall be applicable as per tender.

(c) Beyond the extended Grace period of 30 days, as per "(b)" above, Liquidated Damages shall be levied from the original target date of Project Milestone-I, as per clause- "(iv)" above.

(d) **For Project Milestone-II**: If the PIA has completed 90% work against the Project Milestone-II within the assigned timelines as per tender, there will be a grace period of 30 days for remaining work i.e. up to 10% of the targeted work. There will be no penalty during this grace period of 30 days for the Project Milestone-II.

(e) No **grace** period/ extended grace period shall be available beyond Project Milestone-II. Liquidated Damages shall be levied from the original target date of respective Project Milestones.

Notes:

a. Project penalty/ies may accumulate / carry forward and may consider for setoff against the rollout commitment and considered for final adjustment at the end of project 100% go-live.

b. The above table describes the penalty to be levied in case the PIA is unable to complete the specified GPs within the timelines.

c. T is the date of appointed of selected bidder.

~~d. If the achievement of a milestone is delayed due to any sub-contracted work, the applicable penalties/ LD shall be twice the penalties mentioned in above table for respected milestone.(-LD/ Penalty is capped at 25% of total GP CAPEX of respective package value.)~~

e. In case of delay in delivery milestone of GPs due to RoW approval not received in a month from the date of complete RoW application such GPs shall be excluded from calculation of penalties.

f. Un-recovered penalty from previous bills would be recovered in subsequent bills submitted by the PIA. This clause shall be applicable to all penalties listed in this section.

7.4 THIRD PARTY DAMAGE

a) If the PIA damages other Private Service provider's cables/Oil & GAS-pipelines /sewage line/ Government or public properties, such as electricity cable or roads etc., the damage charges/penalty will be paid by the PIA only as per the claim of such third party. GFGNL/DIGITAL BHARAT NIDHI(DBN), DoT will not be liable to pay any penalty or any damage charges made by the PIA as per the indemnity clause below:

a.1 PIA shall either pay to third parties all expenditure incurred for restoring services which are damaged by it while carrying out the work or the same amount will be deducted from his bills. Such expenditure shall be intimated to the PIA either by Engineer in- charge or concerned third parties in writing. The amount deducted by GFGNL from his bill shall be paid to concerned third parties by the designated authority of GFGNL.

b) The road shoulder(R&B) damaged by PIA Rs. 50,000/- per ~~instances over and above the cap limited~~ will be penalized.

7.5 PENALTY FOR CAUSING INCONVENIENCE TO THE PUBLIC

The bidder shall not be allowed to dump the empty cable drums/waste materials in Govt/public place, which may cause inconvenience to Govt/ Public. If the bidder does not dispose off the empty cable drums/waste materials within 3 days of becoming empty, GFGNL is at liberty to dispose off the drum in any manner deemed fit and the costs incurred by GFGNL in disposing off such materials shall be borne by the Bidder. DIGITAL BHARAT NIDHI(DBN), DoT/DST/ GFGNL may also levy a **penalty up to Rs One Thousand for each such default**.

7.6 PENALTY FOR CUTTING/DAMAGING THE OLD CABLE/ASSET

a) During excavation of trench, utmost care is to be taken by the bidder, so that the existing underground cables of GFGNL are not damaged or cut. In-case any damage/ cut is done to the existing cables of GFGNL, a penalty as per the schedule given below will be charged from the bidder or the amount will be deducted from his running bills. Penalty shall be levied @20% of the penalty amount as per table below in case the repair of damages is carried out within 72 hours and submission of No Objection Certificate within 10 days of occurrence is received by PIA.

Sr. No.	Size of existing UG/OF cables Cut/ Damaged	Amount of penalty per Damage instance
1.	Copper or any other UG cable	Rs 50,000.00 (Fifty Thousand)
2.	OFC of any size	Rs 1,00,000 (one Lakh)
3.	Misc. (to include electrical cable, drainage/sewage pipe, water pipe belonging to state govt or local municipal agency etc.)	Rs 1,00,000 (One Lakh)
4.	Electronics (Router, Switch, UBR, FSO, OLT, UPS, Battery Bank, other active elements, etc.)	Rs 1,50,000 (One Lakh Fifty Thousand)

The bidder shall carry out such repairs for restoration of the damaged cable free of charge. The cost of jointing kit shall also be borne by the bidder. If bidder fails to repair the damage, the cost of repair (including cost of labor + jointing kit) shall be recovered from the bidder in addition to the penalty as prescribed.

b) In accordance with Indian telegraph act, If any person, willfully or negligently damages telegraph/OFC line, he shall be liable to pay the expenses (if any), as may be incurred in making good such damage.

c) PIA shall settle all such claim raised by other operators/ agencies regarding cutting/ damaging their cables or other infrastructure without any cost to DIGITAL BHARAT NIDHI(DBN), DoT/ DST/GFGNL.

7.7 PROTECTION OF LIFE AND PROPERTY AND EXISTING FACILITIES

a. The bidder is fully responsible for taking all possible safety precaution during preparation for and actual performance of the works and for keeping the construction site in a reasonable safe condition. The bidder shall protect all life and property from damage or losses resulting from his construction operations and shall minimize the disturbance and inconvenience to the public.

b. If the excavation of trench alters the outlines of the ground around road and highway crossing in such locations dangerous to traffic, the bidder shall at his own cost, take all necessary precautions to protect public and shall comply with all DIGITAL BHARAT NIDHI(DBN)/GoI/GoG/Telecom/TRAI/DoT/GFGNL regulations as to placing of warning boards (minimum size 3' x 2'), traffic signals, barricades, flags etc., at such location. If the bidder does not put the warning signal as per above directions, then a penalty of Rs 1000/- per day shall be levied on the bidder, till the directions are complied by the bidder. The bidder shall take due precautions to avoid damages to other pipe lines, water mains, sewers, telephones, telegraphs and power conduits, laid wires poles and guy wires, railways, highways, bridges or other underground or above ground structure and/or property crossing or adjacent to the cable trench being excavated.

c. Attention of the bidder is drawn to the rules regarding laying of cables at road crossing, along Railways Bridges, highways safety precautions while working in Public Street as per Engineering Instructions.

d. The bidder shall be solely responsible for location through approved non-destructive means and ensuring the safety of all existing underground pipeline, electrical cables, and or other structures.

e. The bidder shall be solely liable for all expense for and in respect of repairs and/or damages occasioned by injury of or damage to such underground and above structures or other properties and undertake to indemnify DIGITAL BHARAT NIDHI(DBN), GoI/GoG/Telecom/TRAI/DoT/GFGNL from and against all actions, cause of actions, damages, claims and demands what-so-ever, either in law or in equity and all losses and damages and costs (inclusive between attorney and client), charges and expenses in connection therewith and/ or incidental thereto. The bidder shall take all responsibilities and risk in crossing other pipelines and cables and shall be responsible for protecting all such existing pipelines, poles, electric lines, sewers, cables or other facilities from damage by the bidder's operation in connection with the work. The bidder without cost of DIGITAL BHARAT NIDHI(DBN), GoI/GoG/Telecom/TRAI/DoT/GFGNL shall promptly repair any damage incurred.

f. The current market value of any commodities lost as a result of any damage to the aforesaid existing facilities shall be paid by the bidder together with such additional sums necessary to liquidate the personal of property damages, resulting there from.

g. Bidder will solely responsible to follow the GOI,GoG law,wireless,SACFA Guidelines, border policy at concern areas and share to tenderer whenver asked.

7.8 PENALTY FOR DEVIATION FROM STANDARD ENGINEERING INSTRUCTIONS FOR FIBRE LAYING (UNDERGROUND AND AERIAL)

A) Underground Fibre Cable Laying

1. Above ground installation of ducts shall be limited to culvert and bridge crossings only. At such locations, ducts shall be installed inside GI pipe or HDPE DWC pipes with metal sheet protection (GI sheet wrapping) of appropriate size (4" to 6") suitable for number of ducts to be installed

In case, the Successful Bidder does not adhere to the mentioned Engineering Instructions (Annexure B) and does not provide requisite protection, then the Bidder is liable to penalty as per below as per below criteria :

(i) The nominal depth of OFC laying in plain area/ soft soil is 165 cm and that in the hilly area is 120 cm.

(ii) The minimum depth allowed in plain area/soft soil will be 100 cm and that in the hilly area will be 30 cm.

(iii) Depth below 100 cm in plain/soft soil and 30 cm in hilly area will be allowed under exceptional circumstances with the approval of the ~~CEO APBIL.~~GFGNL.

(iv) The payment, in case of less depth, shall be done as under:

In Plain Area

S. No.	Depth (with relaxation) ['d' in cm]	Protection as per EI	Cost of protection (Rs per mtr)	Payment without protection (%)
1	d ≥ 165	No Protection	--	100%
2	165 > d ≥ 150	No Protection	--	(d/165) *97%
3	150 > d ≥ 120	No Protection	--	(d/165) *93%
4	120 > d ≥ 100	DWC	65	(d/165) *85%
5	100 > d ≥ 60	GI*	550	(d/165) *76%
		CC*#	6000 per Cubic M	
6	60 > d ≥ 30	RCC#	8000 per Cubic M	(d/165) *76%

* Any one protection can be used
rates are in per Cu Mtr

In Hilly Area

S. No.	Depth (with relaxation)	Protection as per EI	Cost of protection (Rs per mtr)	Payment without protection (%)
1	d ≥ 120	No Protection	--	100%
2	120 > d ≥ 100	No Protection	--	(d/120) *97%
3	100 > d ≥ 80	No Protection	--	(d/120) *93%
4	80 > d ≥ 50	DWC	65	(d/120) *85%
5	50 > d ≥ 30	GI*	550	(d/120) *76%
		CC*#	6000 per Cubic M	
6	30 > d	RCC#	8000 per Cu M	(d/120) *76%

* Any one protection can be used

rates are in per Cu Mtr

- 'd' shall be rounded off to the nearest multiple of '5' (five).
- In case of depth between 100 Cm to 60 Cm in plain terrain and 50 cm to 30 cm in hilly terrain, the protection of G.I. pipe or CC (1:2:4) needs to be done for 25Cm*25Cm encasing the PLB.
- In case of depth 60 cm to 30 cm in plain and '< 30 cm' in hilly area protection of RCC (1:2:4) needs to be done for 25 cm*25 cm with 12 SWG G.I. mesh of 50 mm*100 mm size.
- The DWC, CC and RCC protection will be retained in EI the rest protection like RCC pipes will be removed from EI.

Note: - There will be no additional payment for any other items except material i.e. DWC/ GI pipe.

Illustration:

1. In case of less depth for plain area, given that the standard depth required is 165 cm and the rate approved is Rs. X/- per meter for the standard depth. For a depth (d) of 101 cm, the rate shall be worked out as below:

   The depth (d) shall be rounded off to 100 cm. Then, the payment shall be calculated as under:

$$= \left(\frac{100}{165}\right) * \left(\frac{85}{100}\right) * X$$

2. In case of less depth for hilly area, given that the standard depth required is 120 cm and the rate approved is Rs. X/- per meter for the standard depth. For a depth (d) of 103 cm, the rate shall be worked out as below:
   The depth (d) shall be rounded off to 105 cm. Then, the payment shall be calculated as under:

$$= \left(\frac{105}{120}\right) * \left(\frac{97}{100}\right) * X$$

B) Aerial Laying

The pole installation and alignments will be recorded as per the Engineering Instruction. The Successful Bidders shall be required to provide all articles used for Aerial OFC laying. In case the Successful Bidder does not use any mandatory article, he shall be required to implement the

articles mentioned as per Annexure and the payment will be not processed until the proper rectification has been completed.

7.9 OPERATION AND MAINTENANCE PHASE

Following table depicts the penalty to be deducted, depending on network uptime. The penalties for Operation and Maintenance provided below shall be applicable as listed in the table below:

7.9.1 SLA FOR THE O&M OF THE EXISTING MADE OVER NETWORK (BSNL LEASED OFC, BHARATNET INCREMENTAL OFC AND GPON EQUIPMENT (OLTS, ONTS, SPVS), TILL THE COMMISSIONING OF IP-MPLS ROUTERS AND NEW RINGS OF PHASE-I AND PHASE- II

SLA Parameters			
Sr. No	**Parameter**	**Permissible Range**	**Remarks**
1	Block wise all GPs-UP Time	≥98.5%	Based on availability from NOC. Exclusions only due to Force Majeure clauses, OLT power down and Electric connection unavailability.
2	GP down due to OFC Cut	One event of a GP going down due to OFC Cut in a month shall be allowed for upto 40% GPs in a Block	

7.9.2 O&M SLA FOR GP NETWORK AVAILABILITY

~~7.10.2.1~~ 7.9.2.1 SLA FOR THE O&M OF THE EXISTING NETWORK (PH-I & PH-II), TILL THE COMMISSIONING OF IP-MPLS ROUTERS AND NEW RINGS

Proposed SLA Uptime Per GP & penalties thereof		
Sr. No.	**Network Uptime**	**% Penalty****
1	>= 98.5%	No Penalty
2	>= 97.5% to < 98.5%	1.0%
3	>= 96.5% to < 97.5%	2.0%
4	>= 95.5% to < 96.5%	4.0%
5	>= 94.5% to < 95.5%	6.0%
6	>= 93.5% to < 94.5%	8.0 %
7	>= 92.5% to < 93.5%	10.0%

Proposed SLA Uptime Per GP & penalties thereof		
Sr. No.	**Network Uptime**	**% Penalty****
8	>= 91.5% to < 92.5%	12.0%
9	~~>= 91.5% to <= 90.0%~~ ≥ 90.0% and < 91.5%	15.0%
10	>=70% to <90.0%	20 .0%
11	<70%	No Payment

Illustration:

I. SLA will be calculated GP wise (i.e. all the GPs under AMC connected to the Block) month wise.

II. There will be a performance-based relaxation in the penalties mentioned in the Table above for the period of one year from the appointed date. The relaxation will be as below:

- **NODE Threat (Service Interruption)**

I. If any active node such as existing Transport,IP-MPLS, RFMS, or Power-conversion system (Other than GP) experiences a threat, outage, or software reporting error due to full or partial equipment faults (either hardware or software related or its subcomponents/slots/network/ service), a penalty will be charged.This shall be applicable for both on or before network migration of IP MPLS and after the migration of the Network on IP-MPLS.

II. Please note that clause is applicable before and after migration on the IP-MPLS technology.

SN	Activities	Penalty
1.	Upto 12Hrs	No Penalty
2.	>12 Hrs to <=24 Hrs	Rs 2000/- per instances
3.	>24 Hrs	Rs 3000/- per 24 Hrs on each instances

~~7.10.2.2~~ 7.9.2.2 PENALTY RELAXATION

There will be a performance-based relaxation in the penalties mentioned in the Table above from the appointed date. The relaxation will be as below

S. N.	Period from the sign of Work Order	Average block wise GPs availability/ Up Time	Rebate on Penalty
1	From date of Onboarding to 3rd months (<= 91 days)	>=90%	No Penalty
		<90%	Discount of 40% of the applicable penalty up to 80% uptime and 20% rebate in case of below 80% uptime
2	3rd to 6th Months (>91 days to <=180 days)	>=95%	No Penalty
		<95%	Rebate of 30% of the applicable penalty up to 85% uptime and 20% rebate in case of uptime below 85%.

There shall be no relaxation beyond the above timelines from appointed date and the penalty shall be applicable as mentioned in the Table of Penalties.

Note:

I. Successful bidder shall follow GFGNL's in house Trouble Ticket Module for capturing the fault status which will in turn be used for SLA calculation through the SLA module.

II. SLAs to be calculated Block wise and penalties to be imposed on monthly basis on O&M charges of the block network.

III. PIA shall ensure above SLAs else the corresponding penalties will be imposed.

IV. Keeping availability of power/infra with their backup is in the scope of selected bidder and hence GPs down time due to Block/GP being down due to Power issues /media failure or equipment failure will also be part of SLA calculation. However, following situation will be considered as beyond control of the PIA,

   a. electricity outage/failure from DISCOM or utility department (more than 6 Hrs in a day(24Hrs)),
   b. The situations/activities included in the Force Majeure clause.
   c. Government intimation for utility shutdown.

   And hence, will be considered as exclusion in SLA by submission of valid evidences-documentations proof to GFGNL.

V. Wherever electric connection is available in GP but not in the building- The PIA can shift the equipment. If no suitable building is available, GFGNL will support administratively wherever feasible with State Authorities for getting Electricity connection. Till it is provided, down time during power unavailability to be excluded from SLA the case will be only applicable for additional GP cases only.

VI. Wherever Electricity Connection is not available in the GP – Exclusion of down time after discharge of battery set shall be allowed in SLA provided the battery is in healthy condition and proper backup and charging system is functional. Wherever electric connection is available in GP but not in the building- The PIA can shift the equipment. If no suitable building is available, GFGNL has to coordinate with State Authorities for getting Electricity connection. Till it is provided, down time during power unavailability to be excluded from SLA.

VII. The shutdown taken for maintenance of fibre by PIA shall be excluded from SLA. However, such shutdown time in a month for a link/ring cannot be more than 8 hours. Further, there should not be more than 1% of links taken for shutdown in a month.

VIII. No exclusion except above or force majeure cases will be permitted.

IX. The PIA and GFGNL or it's authorized ageny/IE shall take the OTDR traces, jointly, on a fort-nightly or sample basis, from the Block and/or GP ends, for all the cases where SLA relaxations are sought by the PIA till RFMS deployment is not completed to achieve the automatic measurement. Selected PIA has to support all field and backend related resources like but not limited to field manpowers (labours), tools(OTDR,LSPM),etc. whenever required by the GFGNL without any additional cost.

~~7.10.2.3~~ 7.9.2.3 SLAS FOR NETWORK AVAILABILITY FOR S-NOC

S N	Measurement Criteria	Definition	Quarterly Target	Penalty as %age of Quart. Payable O&M payment of the State NoC network
1	Network Availability at NOC	All network equipment (Servicing affecting) installed and commissioned at S-NOC including but not limited to GIS, NMS(including OSS, BSS, CRM, Helpdesk, IAM, Compute and storage	≥99.9%	No Penalty
			≥ 99.5% < 99.9%	Proportionate Penalty
			≥ 99% < 99.5%	Twice the Proportionate Penalty
			≥ 95% < 99%	Thrice the Proportionate Penalty
			<95%	Five times the Proportionate Penalty

~~7.10.2.4~~ 7.9.2.4 SLAS FOR NETWORK AVAILABILITY AT SUB-BLOCK/MASTER BLOCK/ TC/ DISTRICT LEVEL FOR RING TOPOLOGY

S. No	Measurement Criteria	Definition	Quarterly Target	Penalty as %age of Quarterly O&M Payment of the Sub-Block
1	Network Availability at Sub-Block/Block	Availability of Sub-Block/Block router	≥ 99.5 %	No Penalty
			≥ 98.5 % to <99.5 %	1%
			>= 97.5% to < 98.5%	2%
			>= 96.5% to < 97.5%	4%
			>= 95% to < 96.5%	7%
			>=90% to <95%	7%+((95%-%Uptime)/0.20)*2% 2% additional penalty on account of each 0.20% reduction in uptime
			<90%	No O&M Payment for associated GP of the Sub-block

Note:

The selected PIA shall mandatorily maintain a minimum 90% monthly uptime for the Sub-Block Router / Master Block-level Infrastructure, failing which no service charges shall be payable for the concerned month, and such failure shall be treated as non-compliance with the prescribed service level requirements.

~~7.10.2.5~~ 7.9.2.5 SLAS FOR NETWORK AVAILABILITY AT GP ON RING ~~AND VILLAGE~~ (AFTER GO-LIVE):

a) SLA will be considered per GP, i.e. last mile equipment -Router/ switch or anything other manageable devices (as per future planning) to be mapped at GP site, payment as per actual SLA achievement of end device availability at last mile equipment will be considered.

Network Uptime	% Penalty For GP ~~/ Village~~
>= 98.5%	No Penalty
>= 97.0% to < 98.5%	1.50%
>= 96% to < 97%	2.50%
>= 95% to < 96%	4.00%
>= 94% to < 95%	6.00%

>= 93% to < 94%	8.00%
>= 92% to < 93%	10.00%
>= 91% to < 92%	12.00%
>= 90% to < 91%	15.00%
>=80.0% to <90%	15%+(90%-% uptime) *5 (5% additional penalty on account of each 1% reduction in uptime)
<80%	No payment

If SLA for 10% GPs of Block will go less than 80% uptime, then O&M Payment for all GPs parenting to that particular block shall be not eligible for claim.

Note:

- **OFC Cut and MTTR :** OFC related penalty clause will remain same as before 100% Go-live

b) The definition for equipment availability is common for all network equipment i.e. availability in Block, (Aggregation) and Gram Panchayat (Access) level Network equipment availability for a Quarter is defined as,

Total time (in minutes) in a Quarter - total down time (in minutes) in a Quarter excluding planned network downtime during that Quarter.

c) The network is considered available when all the services in full capacity are available. However, the downtime of GP router due to downtime of Block/sub-block router shall be excluded from the downtime of GP router for SLA/Penalty purpose.

*Network Availability (%) = (Total minutes during the Quarter – Planned downtime minutes during the Quarter – Unplanned downtime minutes during the Quarter) *100 / (Total minutes during the Quarter- Planned downtime during the Quarter)*

d) Planned downtime: details related to the planned downtime shall be agreed with GFGNL and shall be communicated well in advance. The downtime of the Block and GPs commissioned during the implementation phase shall be calculated on pro-rata basis. Based on district-level and block-level customer/traffic data, Dark Fibre customer cases GFGNL may grant approvals for undergo scheduled maintenance. The standard downtime/maintenance window for backhaul should align with considering standard industrial practices for Scheduled Downtimes (DT) and GP ends for access-related issues. While sending an approval, Bidder has to mention the details and impact analysis in advance. For the cases which have not been approved, they will be subject to penalty/outage criteria. A minimum of 6 hours notification prior to any scheduled maintenance is required. The downtime of the Block and GPs commissioned during the implementation phase shall be calculated on pro-rata basis.

e) **Measurement Tool**: Reports from NMS (OSS) duly approved by GFGNL or its appointed agency,

feedback from end customers, valid e-mail, helpdesk, feedback from GFGNL officials. PIA shall submit Quarterly reports on the performance and adherence to the SLAs while the penalties shall be charged on quarterly basis.

f) **PENALTY CALCULATION ILLUSTRATION**

a) If the network uptime is **98.72%**, it shall be rounded off to one decimal place, i.e., **98.7%**. As this falls under the slab **≥ 98.5%**, **no penalty** shall be applicable.
b) If the network uptime is **97.26%**, it shall be rounded off to one decimal place, i.e., **97.3%**. This falls within the slab **≥ 97.0% to < 98.5%**, and hence the applicable penalty shall be **1.50%**.
c) If the network uptime is **95.84%**, it shall be rounded off to one decimal place, i.e., **95.8%**. This falls within the slab **≥ 95% to < 96%**, and hence the applicable penalty shall be **4.00%**.
d) If the network uptime is **92.37%**, it shall be rounded off to one decimal place, i.e., **92.4%**. This falls within the slab **≥ 92% to < 93%**, and hence the applicable penalty shall be **10.00%**.
e) If the network uptime is **88.64%**, it shall be rounded off to one decimal place, i.e., **88.6%**. Since this falls within the range **≥ 80% to < 90%**, the penalty shall be calculated as per the prescribed formula:
Penalty = 15% + (90 − Actual Uptime) × 5
Accordingly:
Penalty = 15 + (90 − 88.6) × 5
= 15 + (1.4 × 5)
= 15 + 7
= **22.0%**
f) If the network uptime is **81.2%**, it falls within the range **≥ 80% to < 90%**, and the penalty shall be calculated as:
Penalty = 15 + (90 − 81.2) × 5
= 15 + (8.8 × 5)
= 15 + 44
= **59.0%**
g) If the network uptime is **75%**, it falls below **80% uptime**. Hence, as per SLA conditions:
No payment shall be made for the respective period (100% penalty).

I. **SLA Exclusion for upgraded/ newly created Network** : Keeping availability of power/infra with their backup is in the scope of selected bidder and hence GPs down time due to Block/GP being down due to Power issues /media failure or equipment failure will also be part of SLA calculation. However, the following situation will be considered as beyond control of the PIA,
    a) Electricity and manual switching off the equipment(Refer the following clause)
    b) Electricity outage/failure from DISCOM or utility department (more than 12 Hrs in a day(24Hrs)),
    c) The situations/activities included in the Force Majeure clause.
    d) Government intimation for shutdown
    e) Major/critical Breakdown

And hence, will be considered as exclusion in SLA by submission of valid evidences-documentations proof to GFGNL.

II. For exclusing(i) mentioned above, To avoid the electricity and manual switching off the equipment following are the best practices need to adopt by the bidder but not limited to,
    I. To separate out the power connection from other utilities (like fan, bulb etc) in such a way that the BharatNet equipment is not switched off whenever someone switches off other utilities during, night, weekend, holiday periods etc.
    II. Wherever, the daily average availability of electricity is less than 8 Hrs, it is presumed that the Battery may not get fully charged and be able to run the equipment continuously. As overall utility infrastructure for power backup will be in the scope of bidder and hence, Such sites may be captured at the survey stage itself. Bidder has to deploy alternate on field and provisioned for such sites without any additional cost to GFGNL for 24*7*365 days network uptime. However, the same needs to be informed and submit to GFGNL HO for field inventory.
    III. Above arrangement shall leave little chance for asking SLA exclusion due to Electricity Issues.
    IV. PIA shall ensure availability of alternative power arrangements, where electricity is not available beyond 12 hours in a GP.

V. The sharing of FRT team and patroller is not allowed. The GFGNL has the rights to view digital tracker to understand any sharing related information. Any non-compliance or any attempt of willful sharing the FRT team and patroller for saving the FRT team and patroller direct expenses will result into non – availability of FRT team and patroller and necessary deducation provisions related to absence of FRT team and patroller will be applied.

Note:

For network availability and performance-related SLAs, the NMS/EMS records shall be the primary source. For ticket lifecycle, fault acknowledgement, restoration workflow, and service management SLAs, the Helpdesk/Ticketing System records, e-mail, shall be the primary source.For Dark Fibre Customers call,message,e-mail, or any other observations from GFGNL will be prime source. In case of any discrepancy, synchronized audit logs and the SLA measurement methodology approved by GFGNL/IE shall prevail.

The SLA and penalty provisions shall be applied as per the terms and conditions in the RFP. It is clarified that, unless specifically provided otherwise in the RFP, penalties arising from the same root-cause incident shall not be duplicated across multiple network layers(Child-Parent Relationship) for the same period and impact. However, where separate and independently measurable SLA breaches occur, the applicable penalties shall be levied as per the relevant provisions of the RFP.

~~7.10.2.6~~ 7.9.2.6 SERVICE PROVISIONING BY PIA FROM S-NOC

I. From Day-1, the network shall support and enable retail, enterprise, and wholesale services as

per the capabilities of the router, such as but not limited to the following: All type of data and voice services, wireless back-haul traffic for 2G, 3G,4G and 5G services, FTTx, layer2 VPN, layer3 VPN, point 2 Multipoint VPN and VPLS, IPTV and multicast VPN, Cable TV transmission services along with other bandwidth leasing services supported any to any, one to many, many to many kind of services, IoT/ Industrial Internet of Technology(IIoT), etc.

II. The network created should have capability to establish end to end integration as per requirement up to Gujarat State-Wide Area Network (GSWAN) and National Knowledge Network (NKN).

III. In this regard, GFGNL shall facilitate in provisioning of all necessary details and access for a smooth integration.

IV. Selected PIA has to design and propose the solution based on above requirement, Selected PIA will be responsible for end-to-end provisioning during the migration of Ph-I, II and inter connectivity between islands (including the Ph-I & II) and the scope covered under this RFP with good quality and low latency for entire contract duration.

V. However selected PIA has to support with their resources for end to end delivery for field and backend technical/non-technical support for existing as well as future agencies/services on boarded through GFGNL/DST.

S. N	Measurement Criteria	Definition	Target	Penalty
1	Service Provisioning	Provisioning and monitoring of services from S-NOC	Up to 48 hours	No Penalty
			> 48 hours	INR 10,000 per day

- Service provisioning will be in scope of PIA for entire contract duration.
- Service Provisioning has to be done from S-NOC centrally.

~~7.10.2.7~~ 7.9.2.7 MTTR PENALTY

a) Mean Time To Repair (MTTR) shall be monitored on the time taken between logging of complaint against the network and its closure.

b) Measurement Tool: Reports from Ticketing Tool approved by GFGNL or its appointed agency/IE. PIA shall submit Monthly reports on the performance and adherence to the SLA while the penalties shall be charged on Quarterly basis.

c) BIDDER teams will have to maintain MTTR (Mean Time to Repair) of 4 Hrs. for restoration of fibre cuts. In case, BIDDER teams are not able to maintain 4 Hrs. of MTTR, then below mentioned penalties will be levied to BIDDER.

Measurement	Quarterly Target for MTTR on each fibre cut restoration (Hrs)	% Penalty deducted on Qtrly Billing Amount(INR)
Mean Time To Repair (MTTR) for Fibre	up to 4 hrs	No Penalty
	≥ 4 hrs to 8 hrs	500 per additional Hrs
	≥ 8 hrs to 12 hrs	750 per additional Hrs
	≥ 12 hrs	1,000 per each delay of beyond 12Hrs

d) For the ABP Project, Only for the penalty clauses provisions under MTTR, Service Provisioning By PIA From S-Noc, Node Threat (Service Interruption), GP Downtime SLA for Consecutive Times(except for dark fibre) maximum penalty ceiling for any particular site / location shall be equal to 20% of the total quarterly OPEX charges to be paid for respective site.

e) **Over and above maximum penalty cap limit,** Back-to-back penalties will be levied to BIDDER i.e., whatever financial penalty will be levied to GFGNL by its dark fibre leasing customer due to downtime, GFGNL will recover same penalty from BIDDER back-to-back.

f) In addition, for nontangible reputational losses to GFGNL, GFGNL will levy below mentioned penalties to BIDDER.

Note: Mean Time To Repair (MTTR) shall be monitored on the time taken between logging of complaint either manually and/or automatically through RFMS/GIS/NMS for live Fibres to the closure. Further for Dark Fibres/external users, it shall be calculated between logging of complains through Helpdesk/E-mail etc. to its closure.

~~7.10.2.8~~ 7.9.2.8 OFC CUT RESTORATION AND ASSOCIATED PENALTY CALCULATION

a) Since dedicated block level FRT team is to be deployed at every 250Km, and accordingly high O&M charges are provisioned for the effective O&M and high uptime. Therefore, the PIA is obilised to accord high priority to protect the underlined asset of the BharatNet by deploying expert patrollers and high skilled FRT for proactive regular vigilance, connect with the development activities and quick actions for safeguarding the cuts.

b) Therefore, BIDDER teams will have to maintain required quantum of patrolling on field to protect GFGNL OFC Network from damage due to other organizations' activities. As per Telecom standard, number of OFC cuts per 250 Km OFC Network per quarter must not increase 4 Nos /Quarter. If OFC cuts increase beyond 4 Nos /Quarter, then GFGNL will levy below mentioned penalties to BIDDER.

c) OFC cut penalty based on No of cut including dark fibre:

#	Number of OFC cuts per 250Km OFC Network per Quarter	Penalty to be levied to BIDDER team (Rs.)
1.	<=4 nos.	No Penalty
2.	> 4 nos. & <= 5 nos.	2,000 per each cut
3.	> 5 nos. & <= 10 nos.	5,000 per each cut
4.	> 10 nos.	8,000 per each cut*

Note: * Force-Majure, vandalism or damages with FIR, exclusion will be applied subjected to valid document submission from the concern authority

** The selected bidder shall be responsible for continuous monitoring of existing assets through deployment of Field Response Teams (FRTs) and other necessary resources. The bidder must fully understand the critical nature of the service industries like ISP/Telecom/BharatNet service environment, where any disruption to assets may adversely impact end-customer services. Accordingly, the bidder shall ensure round-the-clock (24×7) proactive monitoring and rapid response mechanisms.

~~7.10.2.9~~ 7.9.2.9 DARK FIBRE PENALTY CLAUSE

Any penalty imposed by the customer of dark fibre shall be passed on to the PIA on a back-to-back basis. However, in cases where the same OFC route is impacted across multiple fibre cores serving different customers due to a common failure within the same geographical section, multiple penalties may be levied by different customers.

To avoid duplication of penalties for the same fault event, only the highest applicable penalty among all such affected customers for that OFC section shall be imposed on the PIA.

Illustration (Example)

Consider an OFC route segment from Point A to Point B, where multiple customers are using different fibre cores:

Customer 1 (Core 1): Applies penalty ₹10,000
Customer 2 (Core 2): Applies penalty ₹15,000
Customer 3 (Core 3): Applies penalty ₹8,000

Due to a single cable cut affecting all fibre cores in the same route:

Normally, total penalty = ₹10,000 + ₹15,000 + ₹8,000 = ₹33,000
But as per clause: Only the highest penalty (₹15,000) will be applied to the PIA

Final Penalty on PIA = ₹15,000 (not ₹33,000)

This will be the over and above the cap limit of O&M penalty.

~~7.10.2.10~~ 7.9.2.10 GP DOWNTIME SLA FOR CONSECUTIVE TIMES

SN	GP Downtime	Penalty
1.	< 24 Hrs	No Penalty
2.	< 48 Hrs. to >= 24 Hrs.	2000 Rs
3.	< 72 Hrs. to >= 48 Hrs.	5000 Rs
4.	>= 72 Hrs.	No Payment

~~7.10.2.11~~ 7.9.2.11 PENALTY FOR LATENCY

~~a) SLA allows a maximum of 90ms in the connectivity between the State Head Quarter to all the GramPanchayats.~~
~~b) SLA allows a maximum of 120ms in the connectivity between the State Head Quarter to all the Horizontal Customer Connectivity.~~
~~c) If the Latency is more than the permissible as mentioned above, Successful bidder has to analyze report and escalate to various stakeholders within 2 hours of incident reported. If Successful Bidder fails to analyze, report and escalates to various stakeholders within 2 hours of incident reported, Rs. 1000 per 30 minute or part thereof thereafter will be levied. If the Latency issue not resolved within 24 Hrs Rs. 2000 per Day per instances will be levied or part thereof.~~
d) Bidder is sole responsible to maintain standard industrial practices for services including latency.

~~7.10.2.12~~ 7.9.2.12 PENALTY FOR PACKET LOSS

a) The Packet Loss on the network shall be maintained typically at less than 1%.
b) If the packet loss is more than 1% measured on a monthly basis as mentioned above, selected bidder has to detect, analysis and report to various stakeholders within 2 hours of incident reported.
c) Selected bidder has to take corrective action and resolve the issue within 6 hours of incident reported.

d) If Selected Bidder fails to detect, analysis, report and report to various stakeholders within 2 hours of incident reported, Rs. 1000 per 30 minute or part thereof thereafter will be levied.
e) If Selected Bidder fails to take corrective action and resolve the issue within 6 hours of incident reported, Rs. 2000 per 30 minute or part thereof thereafter will be levied.

Note:

As per Industrial standard practices, Packet loss shall be measured as the percentage of packets lost over total packets transmitted, using standard NMS/monitoring tools (SNMP/ICMP-based or equivalent) on an end-to-end link basis. Further,Measurement shall be carried out on a continuous basis, with SLA compliance evaluated on a monthly aggregate (average) basis.

Any instance where packet loss exceeds 1% shall be treated as an incident, with detection time recorded from system logs/NMS. The selected bidder shall submit monthly reports including link-wise statistics, incident logs, and RCA, supported by tool-generated evidence.

Detailed measurement configuration, SOP and reporting format shall be finalized in consultation with the IE/GFGNL authroized agency.

~~7.10.2.13~~ 7.9.2.13 ALL SOFTWARE INCLUDING EMS SUPPORT RELATED PENALTY

a) Any patch/ new fixes released by the OEM needs to be applied to the corresponding product within 24 working hours. Any delay in applying the patch will attract penalty of Rs. 2000/- per day.
b) Any Software/firmware bug/ application related issue identified by GFGNL/ selected Bidder will be classified in types:
   - **Priority #1:** System outage/ performance related issue effecting the overall functionality of the application including OS migration activites,etc.
   - **Priority #2:** Having bearing on the day to day functioning of the deployed system/ availability of application (part functionality) for the GFGNL users, for example:
     - Unable to provide /fetch/ loss or delay in alarm the necessary parameters/details to other software system of GFGNL like EMS/NMS, GIS, etc.
     - Unable to generate MIS, reports or perform any billing transactions
     - Clearance of VAPT observations, resource utilizations beyond threshold limit
   - **Priority #3 :** Not having bearing on the day to day functioning of the deployed system

Type of Issue	Resolution time (from the time of reporting of incident in the system or ticketing tool)	Penalty amount (exceeding resolution time)
Priority #1	2 hours	Rs. 2000/- (per hour)
Priority #2	4 hours	Rs. 1000/- (per hour)
Priority #3	24 hours	Rs. 500/- (for every 24 hour or part thereof)

Resolution time & the penalty component for the bug fixing is given below (applicable on 24 * 7 basis):

Note:

a) For the calculation of SLAs, the GP shall be taken as Unit.
b) The performance report for all above shall be generated from the Measurement Tool (NMS, Helpdesk tool).
c) BIDDER shall submit the reports on the performance and adherence to the SLA through these tools as per the MIS reports identified in relevant section
d) All incidences reported by NMS should be registered in the Help Desk with Ticket ID.
e) SLA below 95% for network as a whole, consecutively for three months will be a good ground to initiate termination of contract for default.
f) Payment shall be made (after deducting suitable penalty) as percentage of actual Uptime achieved.
g) Per GP OPEX will be total OPEX divided by number of GPs.
h) 12 Hours of downtime per software per quarter is permissible for all software scheduled maintenance and 2 hour of downtime per device per quarter at GP level is permissible.
i) Following will not be considered for downtime calculation:
   - Link down due to power failure and ONT (Optical Network Terminal) switch off at Gram Panchayats. (GPs)
   - Schedule maintenance by vendor with prior information to GFGNL

j) Network SLA can be monitored separately for GP network.

~~k) For any Gross negligence during the contract period, a sum of Rs. 10,00,000/- will be levied for each event of gross negligence and/or for each delayed week or part thereof till resolution. Event can be anything causing substantial impact on services for which the Bidder is responsible.~~

l) The penalty mentioned above for softwared including EMS will be over and above the O&M quarterly penalty cap limit.

~~7.10.2.14~~ 7.9.2.14 DARK FIBER READINESS AND CUSTOMER SERVICE PROVISIONING PENALTIES

i) New O&M Bidder is expected to deliver – 1) Service provisioning 2) Dark fiber readiness, in BharatNet network as per asked GFGNL's customer requirement within average 7 calendar days only.
ii) In case of the delay- for any particular case, beyond 15 calendar days purely attributed to bidder GFGNL may have rights to apply penalty on Rs. 500 per Km or part therof on pending work(or delayed section) per week(or part thereof) from it's payable if the bidder justification for the delay is not satisfactory, i.e., Delay due to approval or other administrative process of GFGNL/any third part and not attributed to the PIA will not be penalized to PIA.
iii) Due to Gross negligence by PIA in service delivery of dark fibre beyond the 6 months, If GFGNL's customer order may cancel, then customer order value shall be levied as a penalty to PIA. Based on the valid evidence, GFGNL may apply one time penalty beyond the CAP limit of project and O&M penalty.

iv) Bidder has to create the required facility to Deliver and maintain dark fibre like additional fibre splice joints , introduction of new chamber, fibre loops, fiber patch cords and connectors for glass through ,etc without any additional cost to GFGNL.

~~7.10.2.15~~ 7.9.2.15 FIBRE HEATH SLA AFTER 100% GO-LIVE

i) PIA is supposed to maintain healthiness of the all fibre cores during the O&M period, PIA has to submit health report (Digitally generated OTDR/RFMS report) quarterly to GFGNL team within a first week of completing quarter. It is expected more than 80% fibre health of each section is to be under permissible loss (i.e, healthy conditions), shall comply fiberization Principles as per RFP Clause-5.7.1 and 5.7.2 and will be taken district as a unit to map all fiber length to GP payment.

ii) The %gap of healthy fiber will reduce GP O&M payment proportionately as withholding amount. PIA shall be given next quarter (90 days) to release this withhold amount by restoring fiber health, beyond one quarter time he won't be eligible to claim amount to GFGNL. However this does not limit GFGNL to hold payment for next quarter till the fiber health is not restored.

~~7.10.2.16~~ 7.9.2.16 PENALTY ON SPARE NON-AVAILABILITY

I. The PIA shall keep the required spares for meeting the SLA defined in above section.

II. The PIA shall have an agreement with all the OEMs for supporting the supplied products for the life time of the contract (10 years). The OEM shall be bound to supply the spares to GFGNL during the entire contract period as per the MAF on the same commercial terms and conditions.

III. In case any equipment is not repairable due to non-availability of the spares, PIA shall replace the supplied products with equal or upgraded/ higher version during life time of contract (10 years) at free of cost. The liability of the PIA for replacement and spares shall be limited to the contract duration of 10 years or the subsequent extension given to the bidder by the GFGNL.

IV. The Bidder has to consider average approximatly 2% in Phase-II and 7% for Phase-I network(indicative and may vary on field, geographyical and environmental situation)failure rate of active elements infrastructure excluding EoSS. Accordingly, Bidder has to arrange the spare equipments. Bidder has to evaluate the network at the time of onboarding and upgrade the network strength with latest elements,Bidder will be solely responsible for SLA achievment . Further, bidder also needs to plan the network migration in advance to recover the old working materials(OLT/ONT/UPS/Switch,etc) and may use the free electronics in network,this to avoid any outage due to lapses of spare or failure of equipments.However,Bidder will be solely responsible for SLA achievment by its own study/analyzing network for managing spare network elements for active and passive.

Note: EoSS expired for all active elements of Phase-I network.

~~7.10.2.17~~ 7.9.2.17 MANPOWER PENALTIES

I. If successful bidder does not deploy the required specified quantity & quality manpower as per

tender document/RFP or a person deployed is not reporting to the duty, there would be a penalty per person per day as defined below and will be deducted from the quarterly payment without any maximum penalty cap. If the above incidence occurs two times in one year, Tenderer reserves the right to terminate the contract and no payment would be made for the services rendered in that Quarter.

Manpower penalties during the Operations Phase		
SN	**Penalty Clause**	**Penalty**
1	• Successful bidder must ensure that the number of personnel required as per Manpower clause at the various operational levels of project. • The successful bidder shall ensure that alternate arrangements are made and leave for a staff is pre-sanctioned by Tenderer. If not, the penalties described in the following column shall apply (Any deviation in qualification or in experience of the deployed manpower will be treated as non-deployment for the purpose of penalty calculation)	1. Manpower Penalty per person for Level-3 Rs. 7000/- per day, Level-2 Rs.3000 Per Day, Level-1 Rs.1000 for un-sanctioned/ non-reporting. FRT Team: Rs. 10000 per day per FRT team of unsanctioned leave or non-reporting or non-deployment.

Note:

I. Prior intimated leave of absence will be allowed: 24 days per designated post in a year.
II. If a resource preceding on leave or becoming absent is replaced with a resource approved by authority, then such substitution will not be treated as absence.
III. In exceptional cases, the tenderer may allow longer period of absence without penalty, provided prior approval is obtained.

~~7.10.2.18~~ 7.9.2.18 EXCLUSION

For the purpose of calculating SLA, the following faults or outage hours shall be excluded.

i) Periods where the GFGNL office staff is inaccessible to confirm the status of the system after fault clearance by the Bidder.
ii) Periods where any link is switched off at GFGNL or Govt. Office due its own reasons. The onus lies on GFGNL or respective Govt. establishment to ensure that the on-site equipment is powered ON and / or the Network Monitoring tools, if any, that are used by GFGNL should be able to filter out the time period of link being voluntarily switched off from the down time calculations.
~~iii) Periods where the failure of any components or equipment belonging to GFGNL / Govt. office.~~
iv) Periods where the official ROW application submitted till the approval notes/communication received from departmental official/authority.
v) These all exclusions will be applicable only after submission of valid documentations /proof to GFGNL.

~~7.10.2.19~~ 7.9.2.19 PROCESS TO MEASURE THE SLA AND PENALTY

All above mentioned SLAs are to be derived based on EMS alarm system.

a. Penalty calculations shall be calculated on accumulated non-compliance for all of the above SLAs.
b. Any planned downtime for maintenance shall be with prior written permission from TENDERER and must be intimated to all users.
c. Any availability/uptime requirements under SLA shall be subject to standard downtime, the time lost due to any of the following reasons will not be considered while calculating the availability/ uptime requirement as per the SLA clause:
d. Time lost due to power or environmental failures;
e. Time taken to recover the system because of power or environmental failures;
f. Time taken for scheduled maintenance/ troubleshooting either for preventive purposes or improvement in function or other purposes;
g. Time taken for reconfiguration or other planned downtime situations;
h. Scheduled shutdowns as required by SDC/ tenderer.

Note:

~~a) The quarterly operational penalty shall be capped at 20% of the actual valid invoice value for the respective quarter for the clauses mentioned above.However, in the event that this cap of 20% is reached for two consecutive quarters during the contract period, the Tenderer shall have the right to either, initiate contract termination proceedings on account of sustained non-performance; or at its discretion, extend the penalty cap to 40% of the quarterly invoice value for the subsequent two quarters.Further, If performance does not improve during this extended period, the Tenderer may proceed with termination of the contract.~~

b) In any case for GP-end network uptime is <90% in consecutive three quarters then GFGNL has full rights to take serious actions against PIA. GFGNL decision will be consider as final decision on this.

~~c) There should be an EMS for monitoring major parameters including Input & Output Voltages, Inside & Outside Temperature, Alarms, % battery back up time left. The monitoring should be possible from SNOC/ Central NOC in real time. Delay in any alarm incident will invite the penalty. For example, for any instance on delay in alarm will be penalized with 0.2% of quarterly O&M billing amount and this will be over and above the maximum O&M cap limit of the O&M billing amount. (The purpose is not the smart rack)~~

d) The successful PIA shall ensure continuous supportability of all active equipment throughout the contract period with OEM warranty, CAMC, TAC support, replacement support, spares, upgrades, or equivalent support arrangements necessary for compliance with contractual obligations and SLAs.The successful PIA shall remain solely responsible for maintenance, OEM support, spare

availability, software support, upgrades, security patches, fault rectification, replacement and SLA compliance of all active network elements during the applicable contract period. No extra payment will be paid to the PIA.

SECTION-8 FINANCIAL BID

8.1 SCHEDULE OF REQUIREMENTS (SOR)

I. The bid is an item rate contract, It is mandatory for the Bidder to submit the duly signed with time stamp, from PoA from the bidder, soft copy and hard copy to the tenderer at the time of financial bid opening in sealed envelope.

S. No.	Item Description	Unit	Total Quantity (GJ)
1	**Package Summary**		
1.1	No. Of Sub-Block	Nos	638
1.2	No. of GPs	Nos	14737
1.2a	No. of GPs for creation	Nos	508
1.2b	No. of GPs for upgradation	Nos	14229
1.3	No. of Villages for last mile connectivity	Nos	4141
2	**Existing Network**		
2.1	Total GPs (Connected on OFC)	Nos	14229
2.2	Total GPs (Connected on Satellite)	Nos	26
2.3	Existing leased RKM from BSNL	RKM	4978
2.4	Total incremental 24F RKM	RKM	20837
2.5	Total incremental 48F RKM	RKM	27612
2.6	Total incremental 96F RKM	RKM	9125
2.7	OLT installed	Nos	638
2.8	ONT installed	Nos	14229
2.9	Other (TC_DC_TDO_DDO_Prant_Other_RSM_GIDC_SOU_Garudeshwar_BHQ_etc.)	Nos	486
3	**New Passive Infrastructure**		
3.1	Fibre Distribution Management System Type I at Sub-Block location - 96F	Nos	293
3.2	Fibre Termination Box/FDMS Type-IIIA & IIIB – 48F at GP locations	Nos	14737
3.3	Fibre Termination Box/FDMS 24F at GP locations	Nos	0
3.4	Fibre Termination Box Ph-I	Nos	0

S. No.	Item Description	Unit	Total Quantity (GJ)
3.5	Fibre Distribution Management System Outdoor at Splicing/Jointing locations	Nos	0
4	**Underground Fibre Services**		
4.1	Supply of 24F OFC, duct and accessories including all the services, as described at serial No.-1	RKM	17000
4.2	Supply of 48F OFC, duct and accessories including all the services, as described at serial No.-2	RKM	11304
4.3	Supply of 96F OFC, duct and accessories including all the services, as described at serial No.-2	RKM	2826
5	**Aerial Fibre Services**		
5.1	Supply of 24F ADSS OFC and accessories including all the services (using existing power poles OR including supply of Poles), as described at serial No.-3	RKM	770
5.2	Supply of Joint Enclosures and pole accessories	Nos	385
5.3	Supply, installation including services of RCC Poles – 7/8 meter	Nos	1925
6	**Passive Infrastructure (Rack)**		
6.1	Rack at Sub-Block locations	Nos	638
6.2	Rack at GP locations	Nos	14737
7	**Active Infrastructure (Router at Sub- Block Location)**		
7.1	**IP-MPLS Router at Master Block location(co-located at Sub-Block)** Supply of router at Master-Block((co-located at Sub-Block) locations with accessories including installation, integration, testing and commissioning **(Category - Type-A)**	Nos	120

S. No.	Item Description	Unit	Total Quantity (GJ)
7.2	IP-MPLS Router at Sub-Block location Supply of router at Sub-Block locations with accessories including installation, integration, testing and commissioning **(Category-Type-B)**	Nos	518
7.3	SFP 100G (with 80km) pluggable	Nos	936
7.4	SFP 100G (with 40km) pluggable (Client Port type 2)	Nos	624
7.5	SFP 10G (with 40km) pluggable (Network Port type 3)	Nos	~~670~~ 690
7.6	SFP 10G (with 80km) pluggable (Network Port type 4)	Nos	~~168~~ 172
7.7	Electrical/Copper SR SFP 1G	Nos.	0
7.8	Optical SFP 10G with 10km pluggable	Nos.	~~4746~~ 4882
7.9	Optical SFP 1G with 10km pluggable	Nos.	1283
7.10	Optical SFP 1G with 40km pluggable	Nos.	68
7.11	EMS for Block routers (including H/W, S/W & licenses)	No. of network elements	638
7.12	EMS additional license including H/W and S/W upgradation	No. of network elements	638
8	**Active Infrastructure (Router GP Location)**		
8.1	IP-MPLS Router at GP location, Supply of router at GP locations with accessories including installation, integration, testing and commissioning **(Category C & D)**	Nos	14737
8.2	SFP 10G with 10Km pluggable (Network Port type 2)	Nos	~~48576~~ 49970
8.3	SFP 1G with 10km pluggable (Client Port)	Nos	40718
8.4	Optical SFP 10G with 40km pluggable	Nos.	~~6858~~ 7054
8.5	Optical SFP 10G with 80km pluggable		~~1714~~ 1764
8.6	Optical SFP 1G with 40km pluggable	Nos.	2143
8.7	Electrical/Copper SR SFP 1G	Nos.	14737

S. No.	Item Description	Unit	Total Quantity (GJ)
8.8	EMS for GP routers (including H/W, S/W & licenses)	No. of network elements	14737
8.9	EMS additional licenses including H/W and S/W upgradation	No. of network elements	14737
9	**Active Infrastructure (RFMS)**		
9.1	Remote Fibre Monitoring System (RFMS) system including necessary hardware and software with accessories including installation, integration, testing and commissioning	Nos	~~394~~ 638
9.2	EMS for RFMS (including H/W, S/W & licenses)	No. of RTUs	~~394~~ 638
9.3	EMS additional license including H/W and S/W upgradation	No. of RTUs	~~394~~ 638
10	**Passive Infrastructure (Power)**		
10.1	Power System with backup provisions at GP locations with accessories including installation, integration, testing and commissioning with provision of MPPT Card including solar panels	Nos	0
10.2	Power System with backup provisions at GP locations with accessories including installation, integration, testing and commissioning with provision of slot for MPPT Card BUT excluding MPPT Card & solar panels (with 6 Hrs of backup)	Nos	14737
~~10.3~~	~~Online UPS (2KVA) with 4 Hrs backup provisions at Block locations with accessories including installation, integration, testing and commissioning with provision of MPPT Card including solar panels~~	~~Nos~~	~~-~~
11	Supply & laying of 6F Aerial drop OFC including accessories like FDMS etc. & services for extending the last mile OF connectivity to villages,	Km	8200
12	Supply, installation including services of RCC Poles – 7/8 meter working load of 115 Kgs for last mile connectivity **with all accessories**	Nos	205000
13	Supply and installation of Joint Chamber as per E.I. for restoration of existing network	Nos	14152

S. No.	Item Description	Unit	Total Quantity (GJ)
14	Supply, installation of Joint Closure, testing and splicing 24 F for Dark Fibre Provisioning and/or attending OFC fault for the first time in a joint as per TEC GR/ E.I. for restoration of existing network	Nos	0
15	**Mini OLTs at GP Locations**		
15.1	Supply, Installation and Commissioning of GPON 4-Port Optical Line Termination Equipment (OLT).	Nos	14737
15.2	Supply, Installation & Commissioning of EMS (1+1) and integration with NMS (per EMS) (at Main and DR Site)	Nos	14737
16	**Alternate Technology(Quantity is just for reference,may vary as per details and specification given at Section**		
16.1	Unlicensed Band Radio (UBR) 5.X with 27dbi Antenna, mounting fixture including all installation material and services without mast on either end (equipment to be supplied in pair to be installed at both ends of a link) for 1 Gbps Throughput	Nos	~~290~~ 356
16.2	MARR type mast (15 Mtr height) for UBR/DMW	Nos	125
16.3	SITC(Supply, Installation,Testing and Commissioning) and acceptance of point to point Li-Fi / FSO link of 1G Capacity including tower/pole/mast/RTT earthing cable, lightening arrester, clamps/fixtures, optical /cat-6 patch cord & electrical cables etc	Nos	20
16.4	SITC(Supply,Installation,Testing andCommissioning) and acceptance of point to point Li-Fi / FSO link of 10G Capacity including tower/pole/mast/ RTT earthing cable, lightening arrester, clamps/fixtures, optical /cat-6 patch cord & electrical cables etc	Nos	21
16.5	Unlicensed Band Radio (UBR) 5.X with 27dbi Antenna, mounting fixture including all installation material and services without mast on either end (equipment to be supplied in pair to be installed at both ends of a link) for 500 Mbps Throughput	Nos	~~125~~ 191
17	**State NOC (Quantity is just for reference,may vary as per details and specification given at Section-5.15**		

S. No.	Item Description	Unit	Total Quantity (GJ)
17.1	SITC Of Geographical Information System (GIS)	No.	1
~~17.2~~	~~SITC Of Network Management System having combined functionality of BSS, OSS, CRM, Helpdesk- grievance management and Inventory and asset management.~~	~~No.~~	~~1~~
17.3	SITC Of Hyper Converged Infrastructure having Backup software facility for all types of EMS, Data analytics, etc.	No.	4
17.4	Leaf switch	No	2
17.5	SITC of NMS & OSS & Inventory and Asset management tool	No	1
17.6	SITC of BSS & CRM	No	1
17.7	SITC of Helpdesk & Greiviance management	No	1

S. No.	Item Description	Unit	Total Quantity (GJ)
17.8	SITC of Data Lake & Network Analytics Platform including data ingestion, storage, processing, dashboarding, reporting, AI-based analytics, geographical visualization, API integration including required licenses/software.	No	1
18	**Telecom Grade Shelter (Quantity is just discovery,Execution and payment will be based on actual)**		
18.1	Supply, installation, testing & commissioning of Porta cabin with all accessories : Length –3 Meter, Width – 3 Meter, Height – 2.7 Meter including Services - of Civil work required to fix porta cabin.	Nos.	280
18.2	Supply, installation, testing & commissioning of Switch Mode Power Supply (SMPS) without rectifier modules.	Nos.	280
18.3	Supply, installation, testing & commissioning of Rectifier modules of 80 Amp(1+1) capacity.	Nos.	560
18.4	Supply, installation, testing & commissioning of 1 set of Battery bank (Capacity: 600 AH for Lithium-Ion Batteries) with warranty	Nos.	280
18.5	Supply, Installation, testing & commissioning of Split AC unit, 2 Ton-BEE star rating(should be 4 star and above)	Nos.	100
18.6	Supply, Installation, testing & commissioning of Split AC controller module	No	50
18.7	Services –Civil work ,Construction of chemical earthing pits with its civil works including supply of all required material, consumables, accessories, cables, etc. to successfully commision the site	Nos.	280

S. No.	Item Description	Unit	Total Quantity (GJ)
18.8	Supply, Installation, testing & commissioning and service of Electrical work with supply of all required materials (types of electrical cables (from row power to UPS and other internal shelter cabling), 2*bus bar, cable tray, ELCB,MCB's (minimum-2*16Amp and 2*32 AMP),lugs, etc.) and all other consumables accessories with casing capping,conduit,mounting clamp etc. to successfully commision the New Shelter site.	Nos.	280
18.9	Supply, Installation, testing & commissioning and service of ELCB(Earth Leakage Circuit Breaker) for Single Phase with 1year onsite replacement warranty	Nos.	1
18.10	Supply, Installation, testing & commissioning and service of ELCB(Earth Leakage Circuit Breaker) for Three Phase with 1 years onsite replacement warranty	Nos.	1
18.11	Supply, Installation, testing & commissioning and service of Single Phase-MCCB (Moulded Case Circuit Breakers)-32 Amp with 1 years onsite replacement warranty.	Nos.	140
18.12	Supply, Installation, testing & commissioning and service of Three Phase -MCCB (Moulded Case Circuit Breakers)-32 Amp with 1 years onsite replacement warranty.	Nos.	140
18.13	Supply, Installation, testing & commissioning and service of Auto Change Over Switch.	Nos.	280
18.14	Supply, Installation, testing & commissioning of Single Phase Air Cooled IP55 Servo Stabilizer Single Phase 10 KVA .	Nos.	112
18.15	Supply, Installation, testing & commissioning of Single Phase Air Cooled IP55 Servo Stabilizer Three Phase 16 KVA	Nos.	168
18.16	Supply, Installation, testing & commissioning FM200-Fire Suppression System/Clean Agent(5Kg)	Nos.	280

S. No.	Item Description	Unit	Total Quantity (GJ)
18.17	Supply, Installation, testing & commissioning Fire Extenguisher(~~2Kg – 6Kg~~)-cylinder	Nos.	280
18.18	Supply, Installation, testing & commissioning of GI pole/angles at every one(1) meter of distance and 1.5 meter (5 ft) wire Chain Link Fencing mesh(2mm) with all necessary accessories GI with anti rusting coated paint for fencing and including colouring and all transportation	Sq. Ft.	12431
18.19	Supply, Installation, testing & commissioning of Entrance Gate for shelter premises with side mounting pillar	Nos.	50
18.20	Services RCC pathway in between main gate and shelter gate (in sq. ft.) with all required material and transportations to make the succesfully commission the site	Sq. Ft.	750
18.21	Foundation and DPC work (for Boundary / Mesh work fencing with wire mesh) 2ft. height with 40 mm DPC with all required material and transportation to make the succesfully commission the site	Sq. Ft.	50
18.22	Fencing Type-2 Boundary wall (Brick/ Stonework) Pre-fabricated with plaster (for 5 ft.)with all required material and transportation to make the succesfully commission the site	Sq. Ft.	10
18.23	Supply, Installation, testing & commissioning of Structured 6 sq mm (DISCOM Pole to DISCOM provided electric meter,i.e., Service Cable for internal wiring during with casing capping/conduit,mouning clamp etc.	meter	56
18.24	Supply, Installation, testing & commissioning of Structured 10 sq mm (DISCOM Pole to DISCOM provided electric meter,i.e., Service Cable for internal wiring during with casing capping/conduit,mouning clamp etc.	meter	56

S. No.	Item Description	Unit	Total Quantity (GJ)
18.25	Supply, installation, testing & commissioning of **2TR twin Circuit without FCU**, with controller Commercial Grade ACs with 5 years+5 Years extended Onsite warranty for Compressor, controller, other active parts (circuits/pcb) and One Year replacement warranty entire Unit	Nos.	147
19	Supply, Installation, testing & commissioning of ONT with all required accessories and cabling required to enable the services	Number	250
20	Supply, Installation, testing & commissioning of of CPE (customer premise equipment – L2 manageable switch)including integration of all accessories and earthing of equipments - CPE (customer premise equipment) L2 manageable switch – 24 ports*	Number	125

Table : A: SoR For IP-MPLS ring

Note - The solution and product offered shall be uniformed in nature, for example, GIS offered product shall have their product including all other offered modules without any third party interface. Same is applicable for PM Tool and WFM, preferrably inbuilt with GIS or may integrate with GIS through API or equivavale mechanism without impacting network performance and realtime updates.

8.2 DETAILED DESCRIPTION OF THE LINE ITEMS, REFERRED IN THE SOR

S. No.	S. No.	Item Description
1	4.1	**Supply of 24F OFC, Duct and Accessories including all the services, as described below:**
		1. Physical survey of block to GP route, capturing the Latitude-Longitude of OF cable route, electronics infrastructure and power infrastructure, preparation of GIS survey report before execution of works.
		2. Supply of 24F armoured optical fibre cable (OFC), duct (40/33 mm) along with accessories and joint chambers, RCC route/ joint indicators, SJC, BJC, FTB/ FDMS or any other accessories required as per TEC-GR including transportation, freight, insurance and warehousing etc.
		3. Excavation of trench for PLB pipe laying, backfilling, reinstatement, and compaction after laying of PLB pipe, laying / blowing of optical Fibre Cable inside laid PLB pipe, splicing and jointing of Optical Fibre Cable including supply of As Built Diagram (ABD) of constructed OFC Route. This shall include fixing of joint chamber, manhole, splice closure, Fixing, painting and sign writing of Route /Joint Indicators, termination at FTB/FDMS and all the relevant accessories etc. The work also includes road / bridge crossing, providing protection as per EI wherever required and obtaining Right-of-Way (RoW) permissions.
		4. Commissioning, Acceptance Testing and makeover of the routes, commissioning of armoured optical fibre connectivity from the Block PoP to GP room and termination at GP router and end to end testing of dark and lit fibre per GP (for Underground laying) (as per the Engineering Instruction given at Section (IV C), Annexure-C)
		5. Capturing the Latitude-Longitude of OF route & joint location after execution of works from Block to GP and capturing coordinates of electronics infrastructure & power infrastructure along with integration of GIS data with As Built Diagram of OF routes, videography and photos as defined in scope of work section of this RFP.
2	4.2	**Supply of 48F OFC, Duct and Accessories including all the services, as described below:**
		1. Physical survey of block to GP route, capturing the Latitude-Longitude of OF cable route, electronics infrastructure and power infrastructure, preparation of GIS survey report before execution of works.
		2. Supply of 48F Ribbon type armoured Optical Fibre Cable (OFC), duct (40/33 mm) along with accessories and joint chambers, RCC route/joint indicators, SJC, BJC, FTB/FDMS or any other accessories required as per TEC-GR including transportation, freight, insurance and warehousing etc.
		3. Excavation of trench for PLB pipe laying, backfilling, reinstatement and compaction after laying of PLB pipe, laying / blowing of optical Fibre
3	5.1	**Supply of 24F ADSS OFC and accessories including all the services (using existing power poles OR including supply of Poles)**
		1. Physical Survey of block to GP route, capturing the Latitude-Longitude of OF cable route, electronics infrastructure and power infrastructure, preparation of GIS survey report before execution of works.
		2. Supply of Self-supporting Metal Free Aerial Optical Fibre Cable (24F ADSS) along with required accessories, including RCC poles and joint chambers,

S. No.	S. No.	Item Description
		SJC, BJC, FTB/FDMS, or any other accessories as per TEC GR, encompassing transportation, freight, insurance, and warehousing.
		3. Slinging / Laying and commissioning of 24 core optical fibre connectivity from Block PoP to GP room and termination at GP Router. The cost shall include laying, fittings, splicing, splitting, splice closure, Pole clamping installation, termination at FTB/FDMS & all the relevant accessories etc. and end to end testing of dark and lit fibre per GP (For Aerial laying) of Optical Fibre Cable. Supply of As Built Diagram (ABD) of constructed OFC Route and Acceptance Testing, commissioning and makeover of the routes. The work also includes road / bridge crossing, providing protection as per EI wherever required and obtaining Right-of-Way (RoW) permissions. (As per the Engineering Instruction at Section , Annexure)
		4. Installation by utilizing existing power infrastructure of State Discoms upto extent maximum possible OR RCC Poles swaged of the length 7/8 meters (includes installation) not utilizing existing power infrastructure of State Discoms
		5. Capturing the Latitude-Longitude of OF route & joint location after execution of works from Block to GP and capturing coordinates of electronics infrastructure & power infrastructure along with integration of GIS data with As Built Diagram of OF routes, videography and photos as defined in scope of work section of this RFP
5	**11**	**Supply of 6F Aerial Drop OFC and Accessories including all the services as per clause of Last mile connectivity**

Table : B: Detailed Description Of the Line Items referred

Notes:

Note 1	**:**	The quantities mentioned in SOR and Price Bid Format are only indicative subjective to the clause 8.3. The actual quantities may vary as per the field survey and requirement. The estimated quantities in the SOR are ultimate quantities for the entire network when all the GPs shall be UP and made over to the PIA.
Note 2	**:**	RKM is the Route Kilometres. The RKM shall be measured through GIS system. However, RKM shall be measured by Rodo Meter till the implementation of GIS system.
Note 3	**:**	Any other item required for completion of the project as per scope of work including but not limited to patch cords, connectors, installation material, adapters, attenuators, software, hardware etc. shall be supplied by the PIA without any additional cost to GFGNL
Note 4	**:**	In Case of GP Router (Item#4a of Financial Price Schedule), the bidder has to supply the type C router in place of type D as per requirement for which the rates shall be 1.2 times the price quoted for GP Router type D at the Price Schedule. The quantity of the type C router will be around 10% of the total quantity. Every GP will have only one type of router, either type C or Type D.
Note 5	**:**	Regarding ADSS OFC implementation the PIA may use GI poles also as per BIS standard No. BIS-2713 in place of RCC poles within the order price only. GFGNL shall not pay any extra amount for the GI Poles.
Note 6	**:**	Regarding ADSS OFC implementation, if the PIA needs to install some additional poles, such requirement shall be submitted to the Independent Engineer. GFGNL shall consider such requirement on the case-to-case basis, based on recommendations of IE and the cost of such additional poles shall be paid (regarding cost of Pole to be used in Last Mile Connectivity).
Note 7	**:**	Since the OFC, to be used, is armoured; in order to trace the faults, suitable Cable Locator with each FRT is to be provided by the PIA
Note 8	**:**	The GPs connected on Satellite are considered for providing connectivity under “No. of GPs for creation “
Note 9	**:**	A Bidder / Lead Bidder shall quote the amount for last mile connectivity as mentioned in price schedule. The total amount shall be equally divided @ 10% per year for entire Contract Period (10 years). For evaluation purpose, the NPV shall be calculated at a discount rate of 10%.
Note 10	**:**	GFGNL reserves the right to place the purchase order at a negotiated price that can be upto average price of all technical valid bids for the items or the bid of the successful bidder, whichever is lower.

Table : C: Notes

8.3 FINANCIAL BID DETAILS

Sr.	Item Description	Unit	Unit cost (INR) (excl. tax) (A)	Quantity (B)	Total Cost (INR) (Excl. tax) (C=A*B)	Rate of CGST INR (D)	Rate of SGST INR (E)	Rate of IGST INR (F)	Total GST INR G=[(D+E) or F	Total cost (Inclusive Of GST) INR H=C+G		HSN/ SAC Code
1a	Supply of 24F OFC, Duct and Accessories including all the services	RKM		17,000						X1		
1b	Supply of 48F OFC, Duct and Accessories including all the services	RKM		11,304						X2		
1c	Supply of 96F OFC, Duct and Accessories including all the services	RKM		2,826						X3		
1d	Supply of 24F ADSS OFC and Accessories including all the services (using existing power Poles)	RKM		154						X4		
1e	Supply of 24F ADSS OFC and Accessories including all the services (including supply of Poles)	RKM		616						X5		
2	Fibre Distribution Management System Type1 at Sub-Block location (96F FDMS(Fully loaded including enclosure))	Nos		293						X6		
3	Fibre Distribution Management System GP location (48F FDMS(Fully loaded including enclosure))	Nos		14,737						X7		
4a	**IP-MPLS Router at GP location (Category Type-D)** Supply of router at GP locations with accessories including installation, integration, testing and commissioning	Nos		14,737						X8		
4b	**IP-MPLS Router at Sub-Block location (Category Type-A)** Supply of router at Sub-	Nos		120						X9		

	Block locations with accessories including installation, integration, testing and commissioning											
4c	**IP-MPLS Router at Sub-Block location (Category Type-B)** Supply of router at Sub-Block locations with accessories including installation, integration, testing and commissioning	Nos		518						X10		
5	SFP 10G with 10 km pluggable	Nos		54,852						X11		
6	SFP 10G with 40 km pluggable	Nos		7,744						X12		
7	SFP 10G with 80 km pluggable	Nos		1,936						X13		
8	SFP 100G with 40 km pluggable	Nos		624						X14		
9	SFP 100G with 80 km pluggable	Nos		936						X15		
10	Optical SFP 1G with 10km pluggable	Nos		42,000						X16		
11	Optical SFP 1G with 40km pluggable	Nos		2,211						X17		
12	Electrical/Copper SR SFP 1G	Nos		14,737						X18		
12a	EMS for GP routers (including H/W, S/W & licenses)	No. of NE		14,737						X19		
12b	EMS for Block routers (including H/W, S/W & licenses)	No. of per NE		638						X20		
12c	EMS additional license including H/W and S/W upgradation for GP router	No. of NE		14,737						X21		
12d	EMS additional license including H/W and S/W upgradation for Block router	No. of per NE		638						X22		
13a	Rack at GP locations	Nos		14,737						X23		
13b	Rack at Block locations	Nos		638						X24		
14	Remote Fibre Monitoring System (RFMS) system including necessary hardware and software with accessories including installation, integration, testing and commissioning	Nos		~~394~~ 638						X25		
15a	EMS for RFMS (including H/W, S/W & licenses)	No. of		~~394~~ 638						X26		

		RTU										
15b	EMS additional license including H/W and S/W upgradation for RFMS	No. of RTUs		~~394~~ 638						X27		
16	Power System with backup provisions at GP locations with accessories including installation, integration, testing and commissioning with provision of slot for MPPT Card **BUT excluding** MPPT Card & solar panels	Nos		14,737						X29		
17	Supply of 6F Aerial drop OFC including services for last mile connectivity as per TEC GR	Km		8,200						X30		
18	Supply, installation including services of RCC Poles – 7/8 meter working load of 115 Kgs for last mile connectivity **with accessories**	Nos		205,000						X31		
19	Supply and installation of Joint Chamber as per E.I. for restoration of existing network	Nos		14,152						X32		
20	Supply, Installation and Commissioning of GPON 4-Port Optical Line Termination Equipment (OLT).	Nos		14,737						X33		
21	Shifting of shelter Infrastructure site (including all the items ~~supplied & installed under the SOW of this RFP~~) from one location to other within the ~~same taluka~~ within 50KM radius	Nos.		20						X34		
~~22~~	~~SITC Of SNOC(State Network Operation Centre)~~	~~Nos.~~		~~1~~								
22.a	SITC Of Geographical Information System (GIS) (Total Cost of 22(a) to 22(g))	No.		1						X35		
~~23~~	~~SITC Of Network Management System having combined functionality of BSS, OSS, CRM, Helpdesk-grievance management~~	~~No.~~	-	~~1~~	-	-	-	-	-	~~X36~~	-	-

	~~and Inventory and asset management.~~											
~~24~~ 22.b	SITC Of Hyper Converged Infrastructure having Backup software facility including all accessories and other resources	No.		4						X36		
~~25~~ 22.c	SITC Of Leaf switch including all accessories and required components	No		2						X37		
~~26~~ 22.d	SITC of NMS & OSS & Inventory and Asset management tool including API and required licenses	No.		1						X38		
~~27~~ 22.e	SITC of BSS & CRM including API and required licenses	No.		1						X39		
~~28~~ 22.f	SITC of Helpdesk & Greiviance management including API and required licenses	No.		1						X40		
~~26~~ 22.g	SITC of Data Lake & Network Analytics Platform including data ingestion, storage, processing, dashboarding, reporting, AI-based analytics, geographical visualization, API integration including required licenses/software.	No.		1						X41		
~~26~~23.a	Supply, installation, testing & commissioning of Porta cabin with all accessories : Length –3 Meter, Width – 3 Meter, Height – 2.7 Meter including Services - of Civil work required to fix porta cabin.	Nos.		280						X42		
~~26~~23.b	Supply, installation, testing & commissioning of Switch Mode Power Supply (SMPS) without rectifier modules.	Nos.		280						X43		
~~26~~23.c	Supply, installation, testing & commissioning of Rectifier modules of 80 Amp(1+1) capacity.	Nos.		560						X44		
~~26~~23.d	Supply, installation, testing & commissioning of 1 set of Battery bank (Capacity: 600 AH for	Nos.		280						X45		

	Lithium-Ion Batteries) with warranty											
~~26~~23.e	Supply, Installation, testing & commissioning of Split AC unit, 2 Ton-BEE star rating(should be 4 star and above)	Nos.		100						X46		
23.f	Supply, Installation, testing & commissioning of Split AC controller module	No		50						X47		
~~26~~23.g	Services –Civil work ,Construction of chemical earthing pits with its civil works including supply of all required material, consumables, accessories, cables, etc. to successfully commision the site	Nos.		280						X48		
~~26~~23.h	Supply, Installation, testing & commissioning and service of Electrical work with supply of all required materials (types of electrical cables (from row power to UPS and other internal shelter cabling), 2*bus bar, cable tray, ELCB,MCB's (minimum-2*16Amp and 2*32 AMP),lugs, etc.) and all other consumables accessories with casing capping,conduit,mounting clamp etc. to successfully commision the New Shelter site.	Nos.		280						X49		
~~26~~23.i	Supply, Installation, testing & commissioning and service of ELCB(Earth Leakage Circuit Breaker) for Single Phase with 1year onsite replacement warranty	Nos.		~~1~~ 150						X50		
~~26~~23.j	Supply, Installation, testing & commissioning and service of ELCB(Earth Leakage Circuit Breaker) for Three Phase with 1 years onsite replacement warranty	Nos.		~~1~~ 40						X51		
~~26~~23.k	Supply, Installation, testing & commissioning and service of Single Phase-MCCB (Moulded Case Circuit Breakers)-32 Amp with 1 years	Nos.		140						X52		

	onsite replacement warranty.											
~~26~~23.l	Supply, Installation, testing & commissioning and service of Three Phase -MCCB (Moulded Case Circuit Breakers)-32 Amp with 1 years onsite replacement warranty.	Nos.		140						X53		
~~26~~23.m	Supply, Installation, testing & commissioning and service of Change Over Switch.	Nos.		280						X54		
~~26~~23.n	Supply, Installation, testing & commissioning of Single Phase Air Cooled IP55 Servo Stabilizer Single Phase 10 KVA .	Nos.		112						X55		
~~26~~23.o	Supply, Installation, testing & commissioning of Single Phase Air Cooled IP55 Servo Stabilizer Three Phase 16 KVA	Nos.		168						X56		
~~26~~23.p	Supply, Installation, testing & commissioning FM200-Fire Suppression System/Clean Agent(5Kg)	Nos.		280						X57		
~~26~~23.q	Supply, Installation, testing & commissioning Fire Extenguisher(~~2Kg – 6Kg~~)-cylinder	Nos.		280						X58		
~~26~~23.r	Supply, Installation, testing & commissioning of GI pole/angles at every one(1) meter of distance and 1.5 meter (5 ft) wire Chain Link Fencing mesh(2mm) with all necessary accessories GI with anti rusting coated paint for fencing and including colouring and all transportation	Sq. Ft.		12,431						X59		
~~26~~23.s	Supply, Installation, testing & commissioning of Entrance Gate for shelter premises with side mounting pillar	Nos.		50						X60		
~~26~~23.t	Services RCC pathway in between main gate and shelter gate (in sq. ft.) with all required material and transportations to	Sq. Ft.		750						X61		

	make the succesfully commission the site											
~~26~~23.u	Foundation and DPC work (for Boundary / Mesh work fencing with wire mesh) 2ft. height with 40 mm DPC with all required material and transportation to make the succesfully commission the site	Sq. Ft.		50						X62		
~~26~~23.v	Fencing Type-2 Boundary wall (Brick/ Stonework) Pre-fabricated with plaster (for 5 ft.)with all required material and transportation to make the succesfully commission the site	Sq. Ft.		10						X63		
~~26~~23.w	Supply, Installation, testing & commissioning of Structured 6 sq mm (DISCOM Pole to DISCOM provided electric meter,i.e., Service Cable for internal wiring during with casing capping/conduit,mouning clamp etc.	meter	-	~~56~~ 5000						X64		
~~26~~23.x	Supply, Installation, testing & commissioning of Structured 10 sq mm (DISCOM Pole to DISCOM provided electric meter,i.e., Service Cable for internal wiring during with casing capping/conduit,mouning clamp etc.	meter	-	~~56~~ 5000						X65		
~~26~~23.y	Supply, installation, testing & commissioning of 2TR twin Circuit without FCU, with controller Commercial Grade ACs with 5 years+5 Years extended Onsite warranty for Compressor, controller, other active parts (circuits/pcb) and One Year replacement warranty entire Unit	Nos.		~~147~~ 280						X66		
~~27~~ 24	Unlicensed Band Radio (UBR) 5.X with suitable ~~27dbi~~ Antenna, mounting fixture including all installation material and services without mast on either end (equipment to	Nos		1						X67		

	be supplied in pair to be installed at both ends of a link) for 1Gbps throughput											
~~28~~ 25	Unlicensed Band Radio (UBR) 5.X with suitable ~~27dbi~~ Antenna, mounting fixture including all installation material and services without mast on either end (equipment to be supplied in pair to be installed at both ends of a link) for 500Mbps throughput	Nos		1						X68		
~~29~~ 26	SITC(Supply, Installation,Testing and Commissioning) and acceptance of point to point Li-Fi / FSO link of 1G Capacity including tower/pole/mast/RTT earthing cable, lightening arrester, clamps/fixtures, optical /cat-6 patch cord & electrical cables etc	Nos		1						X69		
~~30~~ 27	MARR type mast (15 Mtr height) for UBR/DMW	Nos		1						X70		
28	SITC(Supply,Installation, Testing andCommissioning) and acceptance of point to point Li-Fi / FSO link of 10G Capacity including tower/pole/mast/ RTT earthing cable, lightening arrester, clamps/fixtures, optical /cat-6 patch cord & electrical cables etc	Nos		1						X71		
Total (INR) In Numbers (t= Total of Sr. 1 to Sr. ~~30~~ 28 above)- Z1												
Total (INR) In Words												

*Note: Sr. Number ~~26~~ 29 will be total of ~~26a~~29a to ~~26x~~ 29x

Table 1A: PRICE BID FORMAT OF BharatNet Infrastructure (CAPEX)

Notes:

Note 1	**:**	The quantities mentioned in SOR and Price Bid Format are only indicative subjective to the clause 8.3. The actual quantities may vary as per the field survey and requirement. The estimated quantities in the SOR are ultimate quantities for the entire network when all the GPs shall be UP and made over to the PIA.

Note 2	**:**	RKM is the Route Kilometres. The RKM shall be measured through GIS system. However, RKM shall be measured by Rodo Meter till the implementation of GIS system.
Note 3	**:**	Any other item required for completion of the project as per scope of work including but not limited to patch cords, connectors, installation material, adapters, attenuators, software, hardware etc. shall be supplied by the PIA without any additional cost to GFGNL
Note 4	**:**	In Case of GP Router (Item#4a), the bidder has to supply the type C router in place of type D as per requirement for which the rates shall be 1.2 times the price quoted for GP Router type D at the Price Schedule. The quantity of the type C router will be around 10% of the total quantity. Every GP will have only one type of router, either type C or Type D.
Note 5	**:**	Regarding ADSS OFC implementation the PIA may use GI poles also as per BIS standard No. BIS-2713 in place of RCC poles within the order price only. GFGNL shall not pay any extra amount for the GI Poles.
Note 6	**:**	Regarding ADSS OFC implementation, if the PIA needs to install some additional poles, such requirement shall be submitted to the Independent Engineer. GFGNL shall consider such requirement on the case-to-case basis, based on recommendations of IE and the cost of such additional poles shall be paid (regarding cost of Pole to be used in Last Mile Connectivity).
Note 7	**:**	Since the OFC, to be used, is armoured; in order to trace the faults, suitable Cable Locator with each FRT is to be provided by the PIA
Note 8	**:**	The GPs connected on Satellite are considered for providing connectivity under “No. of GPs for creation “
Note 9	**:**	A Bidder / Lead Bidder shall quote the amount for last mile connectivity as mentioned in price schedule. The total amount shall be equally divided @ 10% per year for entire Contract Period (10 years). For evaluation purpose, the NPV shall be calculated at a discount rate of 10%.
Note 10	**:**	GFGNL reserves the right to place the purchase order at a negotiated price that can be upto average price of all technical valid bids for the items or the bid of the successful bidder, whichever is lower.

Table : D: Notes

Note:

For the RFMS case, the bidder shall design and propose the requirement of Stop Pass Filters, Bypass Filters, and other passive optical components based on the network architecture, link engineering, and technical requirements specified in the RFP and approved by IE/GFGNL without any additional cost to GFGNL. Bidder has to ensure the filters(Bypass-Stop Pass) including other optical accessories/components shall be included in the financial line item 14 and related 15(a,b).

Sr.	Item Description	Unit	Unit cost (INR) (excl. tax) (A)	Quantity (B)	Total Cost (INR) (Excl. tax) (C=A*B)	Rate of CGST (D)	Rate of SGST (E)	Rate of IGST (F)	Total GST (in INR) G=C*[(D+E) or F	Total cost (Inclusive Of GST) (in INR) (H=C+G)		HSN / SAC Code
1	SITC and acceptance of Electronics ONT with all required accessories and cabling required to enable the services	Number		250						X 1		
2	Supply, Installation, configuration, Testing, commissioning and acceptance testing of CPE (customer premise equipment – L2 manageable switch)including integration of all accessories and earthing of equipments - CPE (customer premise equipment) L2 manageable switch – 24 ports*	Number		250						X 2		
Total (INR) In Numbers												
Total (INR) In Words												

Table 1B: PRICE DISCOVERY FORMAT OF BharatNet Infrastructure

Note:A

I. The items mentioned in table-1B above shall not be part of evaluation to decide L1 of this bidding process. Further, GFGNL reserves the right to place the purchase order at a negotiated price of the successful bidder.

II. For evaluation purposes, only numbers with two decimal places will be considered.

PRICE BID FORMAT FOR O&M OF Last Mile Enterprise (Horizontal Customer) connectivity

S. No.	Item description	Total Amount in ~~INR~~ Percentages (%) (excluding taxes)
1	O&M services cost for 1st Year per site	
2	O&M services cost for 2nd Year per site	
3	O&M services cost for 3rd Year per site	
4	O&M services cost for 4th Year per site	
5	O&M services cost for 5th Year per site	
6	O&M services cost for 6th Year per site	
7	O&M services cost for 7th Year per site	
8	O&M services cost for 8th Year per site	
9	O&M services cost for 9th Year per site	
10	O&M services cost for 10th Year per site	
Total O&M Expense for 10 years (Z4) - NPV of cost quoted for each year discounted at 8%		

Table 1C: PRICE BID FORMAT FOR O&M OF Last Mile Enterprise Horizontal Customer connectivity

Note: 1

i) Bidder has to refer the Horizontal /LMCA annexure including inventories and Considering CAPEX rate card enclosed alongwith master RFP and corrigendum and submit the % of O&M per year in table above mentioned in Table 1C for both Horizontal and LMCA.

ii) The prices quoted in Table B shall not be considered for determination of L1. Table 1C is being sought for rate discovery and contract management purposes. The successful bidder selected based on Table-A evaluation may be issued work orders/purchase orders during the contract period for items/services covered under Table 1C at the rates quoted, price rate card mentioned in annexure and accepted under the contract and discovery under this bid.

GFGNL	Customer Base With Type Of Connectivity					Total (Numbers)
	UBR	ADSS/Aerial	UG	Cat-6	Li-Fi	
HPIA	49	8194 (Non-Structural)	33	389	6	8671
LMCA	167	607 (Structural-Aerial)	43	21	-	838
Total	216	8801	76	410	6	*9509

* 9509 is indicative and few cases yet in progress, bidder can quote on total 9500 sites, As the existing project rollout is yet in progress counts may vary. however, based on actual execution bidder is bound for O&M and/or field execution.

~~8.4 Financial Bid Evaluation~~

~~Total Quote for the tender:~~

~~S. No.~~	~~Particulars~~	~~Table reference~~	~~Amount (in INR Cr. excl. of taxes)~~
~~1~~	~~ABP Project new components (CAPEX) – Z1~~	~~Total of Table 1A~~	
~~2~~	~~GFGNL Last Mile enterprise Horizontal Customer connectivity – Z4~~	~~Total of Table 1C~~	
	~~Total INR (Z = line item 1 + line item-2) In Numbers~~		
	~~Total INR (Z = line item 1 + line item-2) Amount in words:~~		

~~Table 1D: Evaluation~~

The Financial Bid evaluated based on the total sum of the Table-1 A ~~and Table 1C~~ price to qualifty for L1.

Instructions to fill the Financial Bid:

1. Prices in Financial Bid should be quoted in the provided format. All prices should be quoted in Indian Rupees and indicated both in figures and words. Price in words shall prevail, in the event of any mismatch.
2. GFGNL has the rights to ask qualified bidder to submit the copy -in excel if required for evaluation and comparison of rate on e-mail after opening of financial bid on nProcure.
3. Bidder should provide all prices as per the prescribed format under this Annexure. Bidder should not leave any field blank.
4. All the prices are to be entered in Indian Rupees ONLY (%age values are not allowed).
5. Tenderer reserves the right to ask the Bidder to submit proof of payment against any of the taxes, duties, levies indicated.
6. Tenderer shall take into account that all Taxes, Duties & Levies shall be paid as per actual.
7. For the purpose of evaluation of Financial Bids the Tenderer shall make appropriate assumptions to arrive at a common bid price for all the Bidders. This however shall have no co-relation with the Contract value or actual payment to be made to the Bidder. The soft copy of the financial bid should be in excel format to be uploaded online.
8. Bidders are adviced to quote financials cautiously. Any wrong declaration in financial bid and manipulated design directly co-related with financial bid, etc. will be a good reason to disqualify L1 on account of collude way of misleading and taking advantage in competitive bid at this stage without further negotiation and justification. Then, the next eligible bidder will be called for award of the contract in sequence.
9. Quantity is notational and for calculation purpose. Actual order will be placed separately.
10. GFGNL reserves the rights to give Separate work order for any of the line item on negotiated rates as and when required.

Note: B

I. The Total amount of the "Grand Total (~~excluding~~ including Taxes)" shall be evaluated for financial bid.

II. Any components, services, which is discontinued or putting hardstop/standby the proportionate amount of this components will be reduce from OPEX value.

III. In case, if any other type of electronics equipment (to be installed at centralized as well as field locations) will be procured for this Network in future through separate tender, the PIAs of respective packages will be responsible to perform O&M of those devices. For this, 1% of centralized equipment cost collocated at SDC and 2% of field equipment cost (In between SDC to Block/sub-block/master-block to GP)will be paid to respective PIAs per annum as O&M charges. The items will be procured with sufficient AMC/warranty cover by GFGNL. This clause will apply only in case of equipment procured and set up in uplink layer above GP Router including revenue village level. For horizontal connectivity or from GP Router ~~or~~ to revenue village level, this clause will not apply.

IV. The Items mentioned above is notational and for calculation purpose. However, the Tenderer may reduce or ask for additional quantity as per it's actual requirements. The proportionate cost will be considered as per requirement. Tenderer may derive per unit cost on pro-rata basis for it's requirements. Payment shall be disbursed accordingly.

V. The above quoted applicable rates shall be valid for entire contract duration or any subsequent extensions.

VI. The bidder should submit authorization certificate of Original Equipment Manufacturer (OEM) specific to OS, Database, other software requirement for running the solution etc. being supplied under this project. The bidder should have a back- to-back support agreement/arrangement for OS, Database, other mandatory software/hardware requirement of the solution, for services including upgrades, updates, patches, any other support requirements etc. with the OEMs of products which includes the post-sales support activities for the entire project period.

VII. The above-mentioned GP scope and quantities are notional value, payment will be given based on the actual feasibility and execution of the work. However, GFGNL/DST will have the rights to assign the scope for execution for additional revenue villages/ GP ~~/ TC/DC~~ under the same rate during the entire contract duration.

8.4Rights to Vary Quantities:

i. GFGNL on behalf of DIGITAL BHARAT NIDHI(DBN), DoT will have the right to increase or decrease up to 25% of the overall quantity of works in the schedule of requirements, without any change in the unit price at the time of time of award of the contract or during the contract period

ii. Additional quantities up to 50% of works contained in the running tender/ contract can be ordered during the contract execution stage or within a period of twelve months (earliest one)from date of commissioning of 90% of GPs (and 100% blocks) at the same rate or a rate negotiated (downwardly) with the existing contractors considering the reasonability of rates based on prevailing market conditions and the impact of reduction in taxes and material/services to be obtained within time period scheduled afresh.

iii. In exceptional situation where the requirement is of an emergent nature and it is necessary to ensure continued works from the existing contractors, GFGNL reserves the right to place repeat order up to 100% of the quantities of material/ services contained in the running tender/ contract during the contract execution stage or within a period of twelve months from the date of completion of project at the same rate or a rate negotiated (downwardly) with the existing contractors considering the reasonability of rates based on prevailing market conditions and the impact of reduction in duties and taxes etc.

iv. GFGNL will have full power to accord internal approval to procure any equipment/material in any quantity by any means in the exigencies of services and interest of GFGNL.

v. The Work Orders shall be issued for the quantities finalized through surveys, approved by GFGNL. The Work Order quantities shall not be related to Advance Work Order quantities in any manner. The Quantity variation clauses stated above shall be applicable to the financial bid table mentioned in the section-08 above(not price bid).

vi. The Tenderer may at any time, by a written order given to the Bidder, make changes to the scope of the Contract as specified.

vii. Deletion of GP before start of execution: GFGNL will notify to de-scope the GP to PIA before commencement of work. The PIA will neither execute work for this GP nor will raise any claim to GFGNL for de-scope GP.

viii. Labour Welfare Cess, wherever applicable under the Building and Other Construction Workers' Welfare Cess Act, 1996 and amendments thereof, shall be deducted from the Contractor/PIA's bills at the applicable rate as per further instruction /update issued time to time (presently 1% of the cost of construction, excluding GST and other components as per applicable law) and deposited with the competent authority. The PIA shall provide all necessary information, declarations, and supporting documents required for assessment and statutory compliance. Any additional liability, interest, penalty, or demand arising due to incorrect information, non-compliance, or statutory default attributable to the PIA shall be borne solely by the PIA.

SECTION-9 ANNEXURES & FORMATS

9.1**Format I (Covering Letter)**

Proposal Covering Letter

(To be on the Bidder's letterhead duly Signed by Authorized Signatory)

Tender Ref No:

To

GM, Projects

Gujarat Fibre Grid Network Limited.

Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010

Ref: RFP for selection of Project Implementing Agency for BharatNet Phase-III Project in Gujarat under GFGNL

Dear Sir,

We …… (Name of the bidder) hereby submit our proposal in response to notice inviting tender document no. xxxxxxxxxx Dated: xx.xx.xxxx and confirm that:

1. All information provided in this proposal and in the attachments is true and correct to the best of our knowledge and belief.
2. We shall make available any additional information if required to verify the correctness of the above statement.
3. Certified that the period of validity of bids is 180 days from date of bid submission with claim period of over and above 45 days. In case of price validity beyond claim period, bidder need to submit BG with extendable period for price validity including claim period.
4. We are quoting for all the items (including services) as per the price bid format as mentioned in the RFP.
5. We the Bidder are not under a declaration of Ineligibility for corrupt or fraudulent practices or blacklisted by any of the Government agencies.
6. We have an office in the state and relevant documents for the same are attached. We undertake that if the local presence is not there in the state, that we shall establish an office at Gandhinagar/ Ahmedabad, within 45 days from the date of the award of contract.
7. Gujarat Fibre Grid Network Limited (GFGNL) may contact the following person for further Information regarding this tender:

a. Name & Designation:

b. Full address of office

c. Email ID & Contact No.

8. We are uploading our Response to the RFP (Eligibility, technical and financial bid documents) as per the instructions set out in this RFP.

Yours Sincerely,

(Signature)

Name of Authorized Signatory: Designation:

Date:

Name of the bidder:

[SIGN OF BIDDER]

9.2 **Format II (Power Of Attorney for signing of bid)**

Format for Power of Attorney

(To be provided in original on stamp paper of value required under law duly Signed by 'bidder'**)**

Dated:

POWER OF ATTORNEY

To Whomsoever It May Concern

Know all men by these presents, We .....(name of the firm and address of the registered office) do hereby irrevocably constitute, nominate, appoint and authorize Mr/Ms (name),

..... son/daughter/ wife of…… and presently residing at ..... , who is presently employed with us and holding the position of…… , as our true and lawful attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our Bid for the…… Project proposed or being developed by GFGNL including but not limited to signing and submission of all applications, bids and other documents and writings, participate in Pre-Bids and other conferences and providing information/ responses to GFGNL, representing us in all matters before GFGNL, signing and execution of all contracts, undertakings consequent to acceptance of our bid, and generally dealing with GFGNL in all matters in connection with or relating to or arising out of our bid for the said Project and/ or upon award thereof to us and/or till the entering into of the contract with GFGNL.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

In witness whereof we, ... , the above named principal have executed this power of attorney on this .....day Of …… 20…..

For .....

(Signature,name,designation and address)

To be submitted in original by the Bidders before within 7 days of Bid Due Date.

Witnesses:

1.

2.

Accepted

..... (Signature)

(Name, Title and Address of the Attorney) (Notarized)

Notes:

- The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
- Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders' resolution/ power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

9.3 **Format III (Power of Attorney for Lead and other Member/s of Consortium)**

(To be executed on Stamp paper of appropriate value)

Whereas On behalf of Digital BharatNidhi (DBN), Department of Telecommunication, Government of India, Gujarat Fibre Grid Network Limited(GFGNL) invites online sealed tenders, on rupee payment basis, in two bid (Technical & Financial) system, for Design, Supply, Construction, Installation, Upgradation, Operation and Maintenance of middle mile network of BharatNet.

Whereas, ……..., ……..., …….. and …….. (collectively the "Consortium") being members of the consortium are interested in bidding for the project in accordance with the terms and conditions of the request for proposal (RFP) and other connected documents in respect of the project, and

Whereas, it is necessary for the members of the consortium to designate one of them as the lead member with all necessary power and authority to do for and on behalf of the consortium, all acts, deeds and things as may be necessary in connection with the consortium's bid for the project and its execution.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS

I , …….. having our registered ofoice at ……..., (hereinafter collectively referred to as the "Principal") do hereby irrevocably designate, nominate, constitute, appoint and authorise M/S

…….. having its registered ofoice at ……..., being one of the Members of the Consortium, as the Lead Member and true and lawful attorney of the Consortium (hereinafter referred to as the "Attorney"). I hereby irrevocably authorise the Attorney (with power to sub-delegate) to conduct all business for and on behalf of the Consortium during the bidding process and, in the event the Consortium is awarded the contract, during the execution of the Project and in this regard, to do on our behalf and on behalf of the Consortium, all or any of such acts, deeds or things as are necessary or required or incidental to the qualioication of the Consortium and submission of its bid for the Project, including but not limited toq signing and submission of all applications, bids and other documents and writings, accept the Letter of Award, participate in bidders' and other conferences, respond to queries, submit information/ documents, sign and execute contracts and undertakings consequent to acceptance of the bid of the Consortium and generally to represent the Consortium in all its dealings with the Authority, and/ or any other Government Agency or any person, in all matters in connection with or relating to or arising out of the Consortium's bid for the Project and/ or upon award thereof till the Master Service Agreement is entered into with the Authority.

AND hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said attorney pursuant to and in exercise of the powers conferred

by this power of attorney and that all acts, deeds and things done by our said attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us/ consortium.

IN WITNESS WHEREOF WE THE PRINCIPALABOVE NAMED HAVE EXECUTED THIS POWER OF

ATTORNEY ON THIS …… DAY OF ……. 2..…

For ……..(Signature)
…….. (Name & Title)

For ……..(Signature)
…….. (Name & Title)

For ……..(Signature)
…….. (Name & Title)

Witnesses:

1.

2.

…… (Executants)

(To be executed by all the Members of the Consortium)

Notes:

- The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
- Also, wherever required, the bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders' resolution/ power of attorney in favour of the person executing this power of attorney for the delegation of power hereunder on behalf of the bidder.
- For a power of attorney executed and issued overseas, the document will also have to be legalised by the indian embassy and notarised in the jurisdiction where the power of attorney is being issued. However, the power of attorney provided by bidders from countries that have signed the hague legislation convention 1961 are not required to be legalised by the indian embassy if it carries a conforming apostille certificate.

9.4 Format IV (Integrity Pact)

(To be typed preferably on letterhead of the company)

FORMAT OF INTEGRITY PACT

(To be submitted on Plain Paper)

INTEGRITY PACT

Between

Gujarat Fibre Grid Network Limited (GFGNL) / hereinafter referred to as "The Principal"

and

……..hereinafter referred to as "The Bidder/Contractor"

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for ----------. The Principal values full compliance with all relevant laws, rules and regulations, and economic use of resources, and of fairness and transparency in its relations with its Bidder(s) and/ or Contractor(s).

In order to achieve these goals, the Principal will appoint an Independent External Monitors (IEMs) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

(a) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which he/she is not legally entitled to.

(b) The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

(c) The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/Contractor(s)

(1) The Bidder(s)/Contractor(s) commit themselves to take all measures necessary to prevent corruption. The Bidder(s)/Contractor(s) commit themselves to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

(b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non- submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant Anti- corruption Laws of India; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically and commit any offence under Indian Penal code (IPC)/Prevention of Corruption (PC) Act.

(d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly the Bidders/Contractors(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any.

(e) The Bidder(s)/Contractor(s) will, when presenting their bid, disclose any and all payments made, is committed to or intends to make to agents, brokers or any other in connection with the award of the contract.

(f) Bidder(s)/Contractor(s) who have signed **the Integrity Pact** shall not approach the Courts while representing the matter to **Independent External Monitors (IEMs)** and shall wait for their decision in the matter.

(g) To disclose and transgression with any other company that may impinge on the anti corruption principle.

(2) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s), before contract award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the

tender process or take action as per the defined procedure in GFGNL Procurement Manual, **which is in-force on the date of Publication of tender.**

Section 4 – Compensation for Damages

(i) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit / Bid Security.
(ii) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor the amount equivalent to liquidated damages (LD) of the contract value or the amount equivalent to **Security Deposit/Performance Bank Guarantee (PBG)** in addition to any other penalties/ recoveries as per terms and conditions of the tender.

Section 5 – Previous transgression

(i) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the Anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
(ii) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken as per the defined procedure.

Section 6 – Equal treatment of all Bidders/Contractors/Subcontractors

(i) The principal will enter into agreements with identical conditions as this one with all Bidders/Contractors.
(ii) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors, a commitment in conformity with this Integrity Pact.

(iii) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 – Criminal charges against violating Bidder(s)/Contractor(s)/Subcontractor(s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to Chief Vigilance Officer.

Section 8 – External Independent Monitor/Monitors

1. Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

2. The monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access in all contract documents, whenever required. It will be obligatory for him/her to treat the information and documents of the Bidders/Contractors as confidential. He/she reports to the GFGNL.

3. The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Subcontractor(s) with confidentiality.

Notwithstanding anything contained in this Section, the Bidder(s)/Contractor(s) shall have no obligation whatsoever to provide any internal costing mechanisms or any internal financial or commercial data pursuant to any audit or review conducted by or on behalf of the Principal. Further, the Bidder(s)/Contractor(s) shall not be required to provide any data relating to its other customers, or any personnel or employee related data.

4. The Monitor is under contractual obligation to treat the information and documents of the Bidders/Contractor(s) /Sub-contractor(s) with confidentiality. The Monitor has also signed declarations on “Non-Disclosures of Confidential Information” and of “Absence of Conflict of Interest”. In case of any conflict of interest arising at a later date, the Independent External Monitor (IEM) shall inform GFGNL Official and recuse himself/herself from that case.

5. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

6. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non- binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

7. The Monitor will submit a written report to the Chairperson of the Board of the Principal within 4 to 6 weeks from the date of reference or intimation to him by the ‘Principal’ and, should the occasion arise, submit proposals for correcting problematic situations.

8. If the Monitor has reported to the GFGNL Official, a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and GFGNL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Corporate Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

9. The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by GFGNL official.

Section 10 – Other provisions

1. This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Ahmedabad/Gandhinagar. The arbitration clause provided in the tender document / contract shall not be applicable for any issue /dispute arising under Integrity Pact.
2. Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
3. If the Contractor is a partnership, this agreement must be, signed by all partners.
4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intensions.
5. Issues like Warranty/Guarantee etc. shall be outside the purview of IEMs. For the Principal For the Bidder/Contractor

Place……
Witness 1 : ……
Date ……
Witness 2 : ……

9.5 Format V (Bid Form)

Date: ……

To,

…… ……
…… ……..
…… ……

From,

Ref: Tender Enquiry No. …….. Dated ……

Having examined the above mentioned tender enquiry document including amendment/clarification/ addenda Nos …….. dated ……. the receipt of which is hereby duly acknowledged, we, the undersigned, offer to supply and deliver in conformity with the said drawings, conditions of contract and specifications for the sum shown in the schedule of prices attached herewith and made part of this Bid.

1. We undertake, if our Bid is accepted, to complete delivery of all the items and perform all the services specified in the contract in accordance with the delivery schedule specified in the General Commercial Conditions, read with modification, if any, in eligibility criteria section-3.
2. If our Bid is accepted, we will provide you with a performance guarantee of a nationalized/Scheduled Bank (except co-operative banks), in accordance with clause of PBG of this tender document, for the due performance of the contract.
3. We agree to abide by this Bid for a period of **180 days** from the date fixed for Bid opening or for subsequently extended period, if any, agreed to by us. This bid shall remain binding upon us upto the aforesaid period and may be accepted at any time before the expiration of that period.
4. Until a formal Purchase Order of Contract is prepared and executed, this Bid together with your written acceptance thereof in your notification of award shall constitute a binding contract between us.
5. Bid submitted by us is properly sealed and prepared so as to prevent any subsequent alteration and replacement.
6. We understand that you are not bound to accept the lowest or any bid, you may receive.
7. This bid is being submitted through a legally bound consortium and we hereby submit our irrevocable undertaking (as per Annexure) for using the technical experience and turnover of each consortium member to be used to meet the eligibility conditions for the tender.

Note:
Para-7 may be strike-off, if the bid is being submitted by a sole bidder.

We understand that the Bid document so submitted is the true copy of GFGNL tender documents available on GFGNL website/ e-tendering (nProcure) portal. Any deviation will result in the rejection of the bid.

Dated this ..... day of …… 20...
Name and Signature In the capacity of
Duly authorized to sign the bid for and on behalf of bidder
Witness Address.....
Signature

[SIGN OF BIDDER]

9.5.1 Annexure to Bid Form

#	Member of consortium	Total Average Annual Turnover (in Rs Crores)	Turnover to be considered (in Rs Crores)	Technical experience regarding EPC OFC Network Construction		Technical experience regarding O&M of OFC network		Technical experience regarding Telecommunication equipment installation and commissioning	
				Total experience (in Kms)	Experience to be considered (in Kms)	Total experience (in "Year Kms)	Experience to be considered (in Year Kms)	Total experience (No. of Active Nodes)	Experience to be considered (No. of Active Nodes)
A	B	C	D	E	F	G	H	I	J
1	Lead								
2	Consortium-X Partner								
3	Consortium-Y Partner								
	TOTAL								

We undertake that we will abide by the above submissions, especially the figures of experience and turnover to be considered.

Signature
(Authorized signatory)

Lead Member

Signature
(Authorized signatory)

Consortium Partner -X

Signature
(Authorized signatory)

Consortium Partner -Y

[SIGN OF BIDDER]

9.6Format VI (EMD)

BID SECURITY/ EMD Guarantee

(To be typed on Rs.100/- non-judicial stamp paper)

Sub: Bid Security/EMD guarantee.

Whereas

M/s……R/o……

…… (Hereafter referred to as Bidder) has approached us for giving Bank Guarantee of Rs /- (hereafter known as the "B.G. Amount") valid up to …../……/ 20….. (hereafter known as the "Validity date") in favour of "Gujarat Fibre Grid Network Limited" for participation in the tender of work of vide tender no. ……..

Now at the request of the Bidder, We.....

…..Bank

……Branch having …… …….

…… (Address) and Regd. office address as ……

……..…… …… ……..

…… (Hereinafter called 'the Bank") agrees to give this guarantee as hereinafter contained:

2. We the Bank do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from GFGNL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by GFGNL by reason of breach by the said bidder(s) of any of terms or conditions contained in the said Agreement or by reason of the bidder (s) failure to perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee where the decision of GFGNL in these counts shall be final and binding on the bank. However, our liability under this guarantee shall be restricted to an amount not exceeding the "B. G. Amount".

3. We undertake to pay to GFGNL any money so demanded notwithstanding any dispute or disputes raised by the bidder(s) in any suit or proceeding before any court or tribunal relating thereto our liability under this present being absolute and unequivocal. The Payment so made by us under this bond shall be valid discharge of our liability for payment there under and the bidder(s) shall have no claim against us for making such payment.

4. We the Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of GFGNL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till GFGNL Certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said bidder(s) and accordingly discharge this guarantee. Unless a demand or claim under this guarantee is made on us in writing or before the expiry of Validity date from the date hereof, we shall be discharged from all liability under this guarantee thereafter.

5. We the Bank further agree with GFGNL that GFGNL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said bidder(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by GFGNL against the said bidder(s) and to forbear or enforce any of the terms and conditions relating to the

said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Bidder(s) or for any forbearance, act or omission on the part of GFGNL or any indulgence by GFGNL to the said bidder(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. Notwithstanding anything herein contained ;
(a) The liability of the Bank under this guarantee is restricted to the “B. G. Amount” and it will remain in force up to its Validity date specified above.
(b) The guarantee shall stand completely discharged and all rights of GFGNL under this Guarantee shall be extinguished if no claim or demand is made on us in writing on or before its validity date.

7. In case GFGNL demands for any money under this bank guarantee, the same shall be paid through banker’s Cheque in favour of “Gujarat Fibre Grid Network Limited” payable at Ahmedabad/Gandhinagar.
8. The Bank guarantees that the below mentioned officer who have signed it on behalf of the Bank have authority to give this guarantee under its delegated power.

Place: ……

Date: ……..(Signature of the Bank Officer) Rubber stamp of the bank)
Authorized Power of Attorney Number: …….
Name of the Bank officer: ……..
Designation: ……
Complete Postal address of Bank: ……
Telephone Numbers ……..
Fax numbers……

9.7**Format VII (ISB – Insurance surety bond for bid security)**

BID SECURITY IN FORM OF INSURANCE SURETY BOND

(To be submitted on non-judicial stamp paper of appropriate value)

Insurance Surety Bond for Bid Security

Whereas M/s ..... R/o .... (Hereafter referred to as Principal) has approached us for giving a Surety of Rs. ……/- (hereafter known as the "Surety Amount") valid up to …../……/ 20….. (hereafter known as the "Validity date") in favour of …….(e.g. "Gujarat Fibre Grid Network Limited")(Hereafter referred to as GFGNL) for participation in the tender of work of…….. vide tender no.....

Now at the request of the Principal, We ..... Insurance Company Limited,registered under the Insurance Act, 1938, with its Corporate office, ……..and Registered/Head Office ..... (the "Surety") to transact the business of Surety Insurance under the powers conferred under Section 14 (2) (i) of IRDA Act, 1999 & IRDA Guidelines issuedvide IRDAI/NL/GDL/SIC/01/01/2022 3rd January, 2022, agreed to give this Surety Bond by way of performance guarantee as hereinafter contained:

2. We, the Surety, do hereby undertake to pay the amounts due and payable under this Surety without any demur, merely on a demand from the GFGNL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the GFGNL by reason of breach by the said Principal of any of terms or conditions contained in the said tender Agreement or by reason of the Principal's failure to honour its bid submitted to perform the said works. Any such demand made on the Surety shall be conclusive as regards the amount due and payable by the Surety under this Surety where the decision of the GFGNL in these counts shall be final and binding on the Surety. However, our liability under this Surety shall be restricted to an amount not exceeding the "Surety Amount".

3. We, the Surety, undertake to pay to the GFGNL any money so demanded notwithstanding any dispute or disputes raised by the Principal in any suit or proceeding before any court or tribunal relating thereto our liability under this present being absolute and unequivocal. The Payment so made by us under this bond shall be valid discharge of our liability for payment there under and the Principal shall have no claim against us for making such payment.

4. We the Surety, further agree that the Surety herein contained shall remain in full force and effect during the period that would be taken for the performance of the said tender agreement and that it shall continue to be enforceable till

all the dues of the GFGNL under or by virtue of the said tender Agreement have been fully paid and its claims satisfied or discharged or till GFGNL Certifies that the terms and conditions of the said tender Agreement have been fully and properly carried out by the said Principal and accordingly discharge this Surety. Unless a demand or claim under this Surety is made on us in writing or before the expiry of Validity date from the date hereof, we shall be discharged from all liability under this Surety thereafter.

5. We the Surety further agree with the GFGNL that the GFGNL shall have the fullest liberty, without our consent and without affecting in any manner our obligations hereunder, to vary any of the terms and conditions of the said tender Agreement or to extend time of performance by the said Principal from time to time or to postpone for any time or from time to time, any of the powers exercisable by the GFGNL against the said Principal and to forbear or enforce any of the terms and conditions relating to the said tender agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Principal or for any forbearance, act or omission on the part of the GFGNL or any indulgence by the GFGNL to the said Principal or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. Notwithstanding anything herein contained:
   (a) The liability of the Surety under this Surety bond is restricted to the "Surety Amount" and it will remain in force up to its Validity date specified above.
   (b) The Surety shall stand completely discharged and all rights of the GFGNL under this Surety shall be extinguished if no claim or demand is made on us in writing on or before its validity date.

7. In case GFGNL demands for any money under this Surety Bond, the same shall be paid through Banker's Cheque in favour of "Gujarat Fibre Grid Network Limited" payable at Ahmedabad/Gandhinagar or by any other mode such as NEFT/RTGS, etc., as indicated by GFGNL in its demand letter.

8. The Surety declares that the below mentioned officer who have signed it on behalf of the Surety, have authority to give this Surety under its delegated power.

Place: .....

Date: ……..(Signature of the Insurance Company Officer)
Rubber stamp of the Insurance Company

Authorized Power of Attorney Number: …….. Name of the officer: ……
Designation: .....
Official Email ID:.....

[SIGN OF BIDDER]

Complete Postal address of Insurance Company: ……..
Telephone Numbers ……...
Fax numbers ……

Name, Address, Contact number and official Email ID of the Controlling Office of the Surety Issuing Branch or any web portal link, from whom / where the Surety Bond can be got confirmed by GFGNL.

……..
……..
……..
……..

9.8Format VIII (PBG)

PERFORMANCE BANK GUARANTEE

(To be stamped in accordance with Stamp Act)

Ref: Bank Guarantee No.

Date:

To,

GM (----------)

Gujarat Fibre Grid Network Limited

Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010

Dear Sir,

WHEREAS..... (Name of Bidder) hereinafter called “the Bidder" has undertaken, in pursuance of Agreement dated, (hereinafter referred to as "the Agreement for “RFP for selection of ~~service Provider~~ PIA for providing ---------- for a period of ------ Years ***(Tender No. xxxxxxxxxxxxxxxx Dated: xx.xx.xxxx)*** for the Department of Science & Technology, Government of Gujarat.

AND WHEREAS it has been stipulated in the said Agreement that the Bidder shall furnish a Bank Guarantee ("the Guarantee") from a scheduled bank for the sum specified therein as security for implementing PROJECT.

1. WHEREAS we____("the Bank", which expression shall be deemed to include it successors and permitted as Signs) have agreed to give the Gujarat Fibre Grid Network Limited ("GFGNL") the Guarantee:

THEREFORE, the Bank hereby agrees and affirms as follows:

The Bank hereby irrevocably and unconditionally guarantees the payment of all sums due and payable by the Bidder to GFGNL under the terms of their Agreement dated_____.

Provided, however, that the maximum liability of the Bank towards GFGNL under this Guarantee shall not, under any circumstances, exceed

_____ in aggregate.

2. In pursuance of this Guarantee, the Bank shall, immediately upon the receipt of a written notice from GFGNL in that behalf and without delay/demur or set off, pay to GFGNL any and all sums demanded by GFGNL under the said demand notice, subject to the maximum limits specified in Clause 1 above. A notice from GFGNL to the Bank shall be sent by Registered Post (Acknowledgement Due) at the following address:

_____

_____

_____

Attention Mr._____.

[SIGN OF BIDDER]

3. This Guarantee shall come into effect immediately upon execution and shall remain in force for a period of months from the date of its execution. The Bank shall extend the Guarantee for a further period which may be mutually decided by the bidder and GFGNL.

The liability of the Bank under the terms of this Guarantee shall not, in any manner whatsoever, be modified, discharged, or otherwise affected by:

- Any change or amendment to the terms and conditions of the Contract or the execution of any further Agreements.
- Any breach or non-compliance by the Bidder with any of the terms and conditions of any Agreements/credit arrangement, present or Future, between Bidder and the Bank.

4. The BANK also agrees that GFGNL at its option shall be entitled to enforce this Guarantee against the Bank as a Principal Debtor, in the first instance without proceeding against the BIDDER and not withstanding any security or other guarantee that GFGNL may have in relation to the Bidder's liabilities.

5. The BANK shall not be released of its obligations under these presents by reason of any act of omission or commission on the part of GFGNL or any other indulgence shown by GFGNL or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the BANK.

6. This Guarantee shall be governed by the laws of India and the courts of Gandhinagar shall have jurisdiction in the adjudication of any dispute which may arise hereunder.

Dated this ……. Day of..... ,2026

Witness

(Signature)
(Name)
(Name)
(Official Address)
Plus Attorney as per Power of Attorney No.
Dated:

(Signature)
Bank Rubber Stamp

Designation with Bank Stamp

Approved Bank: All Nationalized Bank including the public sector bank or Private Sector Banks or Commercial Banks or Co-Operative & Rural Banks (operating in India having branch at Ahmedabad/ Gandhinagar) as per the G.R. no. EMD/10/2020/42/DMO dated 19.10.2020 issued by Finance Department or further instruction issued by Finance department time to time.

9.9 Format IX Performance security Guarantee Bond

In consideration of the Gujarat Fibre Grid Network Limited (hereinafter called 'GFGNL') having agreed to exempt (hereinafter called 'the said contractor(s)') from the demand under the terms and conditions of an agreement/Advance Purchase Order No……. dated…… made between …….. and …… for ……. the supply of …….(hereinafter called "the said agreement "), of security deposit for the due fulfilment by the said contractor (s) of the terms and conditions contained in the said Agreement, on production of the bank guarantee for ……we, (name of the bank) … (hereinafter refer to as "the bank") at the request of (contractor (s)) do hereby undertake to pay to GFGNL an amount not exceeding against any loss or damage caused to or suffered or would be caused to or suffered by GFGNL by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

2. We (name of the bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from GFGNL by reason of breach by the said contractor(s)' of any of the terms or conditions contained in the said Agreement or by reason of the contractors(s)' failure to perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee where the decision of GFGNL in these counts shall be final and binding on the bank. However, our liability under this guarantee shall be restricted to an amount not exceeding.

3. We undertake to pay to GFGNL any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)/supplier(s) in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the contractor(s)/supplier(s) shall have no claim against us for making such payment.

4. We(name of the bank)further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of GFGNL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till (office/ Department) GFGNL certifies that the terms and conditions of the said Agreement have been fully or properly carried out by the said contractor(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the expiry of Two YEARS (as specified in P.O) from the date hereof, we shall be discharged from all liabilities under this guarantee thereafter.

5. We (name of the bank) further agree with GFGNL that GFGNL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by GFGNL against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of GFGNL or any indulgence by GFGNL to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s)/ supplier(s).
7. We (name of the bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of GFGNL in writing.

Place
Date

(Signature of the Bank Officer) ……..
Rubber stamp of the bank:…….
Authorized Power of Attorney Number:……..
Name of the Bank officer:……..
Designation:……
Complete Postal address of Bank:…….
Telephone Numbers……..
Fax numbers……..

9.10 Format X Performance Guarantee Surety Bond

(To be submitted on non-judicial stamp paper of appropriate value)

To ,
GFGNL,

Surety Bond No : ……
Surety Bond Issue dt : …….
Surety Bond Amt. :INR…….
Bond Valid upto : …….
Bond Claim Period :……..

Dear Sir / Madam,

Whereas ……..(e.g. Gujarat Fibre Grid Network Ltd)(hereafter referred to as GFGNL) has issued an APO/AWO no. ……..Dated……awarding the work of …… …… (the "Agreement")to M/s……., R/o……. (hereafter referred to as "Principal") and GFGNL has asked Principal to submit a performance guarantee in favour of …… (e.g. Gujarat Fibre Grid Network Ltd) of INR …… (hereafter referred to as "Bond Amount") valid up to dd.mm.yyyy(hereafter referred to as "Validity Date")

Now at the request of the Principal, We..... Insurance Company Limited,registered under the Insurance Act, 1938, withits Corporate office,…….and Registered/Head Office …… (the "Surety")to transact the business of Surety Insurance under the powers conferred under Section 14 (2)
(i) of IRDA Act, 1999 & IRDA Guidelines issuedvide IRDAI/NL/GDL/SIC/01/01/2022 3rd January, 2022, agreed to give this Surety Bond by way of performance guarantee as hereinafter contained:

2. The Surety do hereby undertake and assure to the GFGNL that, if in opinion of GFGNL the Principal in any way fails to observe or perform the terms and conditions of the Agreement or commits any breach of its obligations there-under, the Surety shall on demand and without any objection or demur pay to the GFGNL such sum or sums up to an aggregate sum of the Bond Amount or such lesser amount as GFGNL may demand without requiring GFGNL to have recourse to any legal remedy that may be available to it to compel the Surety to pay the same.

3. Any such demand from the GFGNL shall be conclusive as regards the liability of Principal to pay to GFGNL or as regards the amount payable by the Surety under this Surety Bond. The Surety shall not be entitled to withhold payment on the ground that the Principal had disputed its liability to pay or has disputed the quantum of the amount or that any arbitration proceeding or legal proceeding is pending between Principal and GFGNL regarding the claim.

4. The liability of the Surety under this Surety Bond is restricted to the Bond Amount and this Surety Bond shall come into force from the date of its issue and shall remain in full force and effect up to its Validity date.

5. The Surety further agrees that the GFGNL shall have the fullest liberty without the consent of the Surety and without affecting in any way the liability of the Surety under this Surety Bond to vary any of the terms and conditions of the Agreement or to extend the time for the performance contained in the Agreement from any of the powers exercisable by GFGNL against the Principal and to forebear from enforcing any of the terms and conditions relating to the Agreement and the Surety shall not be relieved from its liability by reason of such failure or extension being granted to Principal or through any forbearance, act or omission on the part of GFGNL or any indulgence by GFGNL to Principal or any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of relieving or discharging the Surety.

6. In case GFGNL demands for any money under this Surety Bond, the same shall be paid through banker's Cheque in favour of "Gujarat Fibre Grid Network Limited" payable at Ahmedabad/Gandhinagar or by any other mode such as NEFT/RTGS, etc., as indicated by GFGNL in its demand letter.

7. The Surety guarantees that the below mentioned officers who have signed it on behalf of the Surety have authority to give this Surety Bond under its delegated power.

Notwithstanding anything contained herein above:

1. Our Liability under this Surety Bond shall not exceed
   INR ……..(Rupees: ……. Only).

2. This Surety Bond shall be valid upto……(Validity date)

3. Further a claim period of 3(three)months from the Validity date of the Surety Bond is available to make a demand under this Surety Bond. We are liable to pay the Bond Amount or any part thereof under this Surety Bond only and only if you serve upon us a written claim or demand on or before …….. (Date of claim period if any).

4. At the end of expiry of the Validity Date (including claim period), unless an action to enforce the claim under this Surety Bond is initiated before the Court or Tribunal on or before 12 months after the expiry of the Validity Date (including claim period), all your rights under this Surety Bond shall stand extinguished and we shall be relieved and discharged from all our liabilities and obligations under this Surety Bond irrespective of return of original Surety Bond

Place: ……

Date: …….. (Signature of the Surety)

Rubber stamp of the Surety

Authorized Power of Attorney Number: ……. Name of the Surety officer:
…….. Designation: ……
Complete Postal address of Surety: ……
…… Telephone Numbers
…….. Fax numbers ……
Email ID (only official Email ID) ……..

Name, Address, Contact number and official Email ID of the Controlling Office of the Surety Issuing Branch or any web portal link, from whom/ where the Surety Bond can be got confirmed by GFGNL.

……..
……
……

9.11 Format XI ABG

MOBILIZATION ADVANCE SECURITY GUARANTEE BOND FORMAT OF MOBILIZATION ADVANCE BANK GUARANTEE"

Sub: Advance Bank Guarantee no. ……for value……
[Insert ABG value here]…… in respect……of……Purchase Order No……..("PO"):……Dated……for value [Insert total PO value]

In consideration of "Gujarat Fibre Grid Network Limited" (hereinafter called "GFGNL") agreeing to make advance payment of [Insert ABG value in figures and words] ("Advance Payment") to [Insert the name of the Contractor with address, contact person's telephone/mobile number and email address], having its registered office at {Insert the full address }"hereinafter called 'the said contractor') which has been unequivocally accepted by the contractor and the contractor having agreed to provide an irrevocable Advance Bank Guarantee ["Advance Bank Guarantee"] in accordance with the terms and conditions of the said PO, we, {Insert the Issuing Bank name and address}("the Bank") hereby unconditionally agree and undertake to hold at your disposal, [Insert ABG value] and agree with you as follows:

1. Under the terms of the said GFGNL has agreed to pay to the contractor an advance payment of [insert the ABG value in figures and words)…… being …..% of the basic value/total value of the said PO, against furnishing of an Irrevocable Advance Bank Guarantee of equivalent amount by the Supplier.

2. The Bank at the request of the contractor has agreed to give this unconditional and irrevocable Advance Bank Guarantee and agree and undertake not to revoke the same.

3. The Bank, hereby guarantee that the Supplier will duly comply and faithfully perform all their obligations and responsibilities under the said PO, failing which we, the Guarantor, do hereby unconditionally undertake to pay to the Purchaser ON MERE DEMAND AND WITHOUT ANY DEMUR AND WITHOUT RECOURSE TO THE SUPPLIER such amount or amounts as the Guarantor may be called upon to pay not exceeding in the aggregate a sum of [insert ABG value in figures and words]…….

4. The Advance Bank Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Supplier but shall in all respects and for all purposes be binding and operative until payment of all monies due to GFGNL under the Advance Bank Guarantee are paid.

5. The decision of GFGNL that any sum has become payable shall be final and binding on the Bank.

6. The Advance Bank Guarantee shall be governed by the laws of India.

7. We (Bank Name) , shall on simple demand from the Purchaser pay immediately to the Purchaser, the said amount of (Insert ABG value in figures and words)……. without any demur and without requiring the Purchaser to invoke any legal remedy that may be available to them, to compel the Guarantor to pay the Advance Payment amount, even if

the Supplier considers such demand of the Purchaser is unjustified.

8. Any notice by way of request, demand or otherwise hereunder may be sent by courier, fax or by post to the Bank on or before the expiry date of the Advance Bank Guarantee. GFGNL may lodge request/demand in writing at our branch ……..[Insert specific branch name and full address with telephone/fax numbers] at on or before the expiry of the Advance Bank Guarantee as stated under clause no.9.

9. We (Bank Name) undertake to pay to GFGNL any money so demanded notwithstanding
any dispute or disputes raised by the contractor(s)/supplier(s) in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the contractor(s)/supplier(s) shall have no claim against us for making such payment

10. Our liability under the Advance Bank Guarantee is restricted to a sum of [Insert ABG value in figures and words) and the Advance Bank Guarantee shall remain in force until ..... (date) or such extended period as may be required by GFGNL & Contractor and unless a claim under the Advance Bank Guarantee is lodged with us within three months from the date of expiry of the Advance Bank Guarantee at our branch i.e. on or before ……(date) or such extended period as the case may be, all your rights under the Advance Bank Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities under the Advance Bank Guarantee.

11. We (name of the bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of GFGNL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till (office/ Department)

12. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s)/ supplier(s).

13. We (name of the bank)…….. lastly undertake not to revoke this guarantee during its currency except with the previous consent of GFGNL inwriting.

Place
Date (Signature of the Bank Officer)
Rubberstamp of the bank: Authorized Power of Attorney Number: Name of the Bank officer:
Designation:

Complete Postal address of Bank:

9.12 Format XII Summary of EMD, Company Registration, Office in Gujarat, Work experience and Turnover

Earnest Money Deposit Details

Sr. No.	Item	Amount (In Rs.)	Name of the Bank & Branch	Bank Guarantee No.
1	Earnest Money Deposit (E.M.D.)			

Eligibility Criteria

Form No. A: Company Registration

Sr. No.	Name of Bidder	Certificate of Incorporation	Document Submitted or Not?
1			

Note: Please fill this form and upload the supporting documents.

Form No. B: Office in GUJARAT

Sr. No.	Address	Contact Person	Contact Nos.	Type of supporting document attached
1				

Note: You may mention more than one office (if applicable) by adding multiple rows which may be added by "NUMBER OF ROWS TO ADD".

Form No. C: Work Experience

Sr. No.	Project	Project Details	Period of Contract	Contact details of client	Type of supporting document attached
1					

Note: You may mention more than one project by adding multiple rows which may be added by "NUMBER OF ROWS TO ADD".

Financial Details of the Bidder

	Turnover (INR: In Lakh)		
2022 – 23	**2023 – 24**	**2024-25**	**2025-26 (Non-Audited)**

Note:
1. Submit the audited financial statement/ audited annual report of the above-mentioned financial years.

Name:
Designation:
Signature of the Authorized Signatory (with seal):

9.13 Format XIII (Performa of compliance)

Performa of Compliance Letter

(Submit copy on Bidder's letterhead duly signed by Authorized signatory)

Date : *dd /mm /yyyy*

To,
GM (----------)
Gujarat Fibre Grid Network Limited
Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010

Sub. : Compliance with the tender terms and conditions, specifications and Eligibility Criteria.

Dear Sir,

With reference to above referred tender, I, undersigned <<Name of Signatory>>, in the capacity of
<<*Designation of Signatory*>>, is authorized to give the undertaking on behalf of <<*Name of the bidder*>>. We have to inform you that we have read and understood the technical specifications and total requirements of the above-mentioned bid submitted by us on <<*Date*>>. We hereby confirm that all our quoted items meet or exceed the requirements and are absolutely compliant with specifications mentioned in the bid document.

We also explicitly understand that all quoted items meet technical specifications of the bid and that such technical specifications override the brochures/standard literature if the same contradict or not indicated in brochures.

We are not banned or blacklisted by any Government institution of India.

In case of breach of any of the terms and conditions of the tender or deviation from bid specifications other than already specified as mentioned above, the decision of GFGNL Tender Committee for disqualification will be final and accepted by us.

Thanking you,

For <Name of the bidder>>
<<Authorized Signatory>>
<<Stamp of the bidder>>

9.14 Format XIV (Not Banned/Blacklisted/Debarred)

Declaration Letter

Physical submission on Company's letter head.

FORMAT OF UNDERTAKING for Non-Blacklisting of the Bidder

(to be provided on Non – judicial stamp paper of INR 100/- or such equivalent amount and duly attested by notary public)

Place:
Date:

To,
_____
_____

Ref: Tender No. ____ issued on ____.
Subject: Declaration Letter for Non-Blacklisting of the Bidder.

Sir/Madam,

We, the undersigned, hereby declare that we are not blacklisted/ debarred with Ministry of Communication or GFGNL or debarring order issued by Department of Expenditure (DOE), Ministry of Finance (MOF) covering all central Ministries/ Departments as per provision of OM No.F.1/20/2018-PPD by Department of Expenditure (DoE), MoF dated on 2nd Nov 2021, as on Bid submission date.

For and on behalf of Signature:
(Authorized Signatory) Name of the person: Designation:
Name of the Respondent:
Address of the Respondent: Company seal:

9.15 Format XV (Land Border)

Certificate to be submitted by Bidders, consortium members and OEM

(on Non-Judicial stamp of Rs. 300/-)

Reference 1: GFGNL Tender No.

Reference 2: Department of Expenditure Office Memorandums (OMs) No. 7/10/2021- PPD (1) dated 23rd February 2023 and its subsequent Clarification, if any.

I, in capacity of authorized signatory of M/s……...having Regd. office at…….. being a participant bidder in GFGNL tender cited at reference 1 above, hereby declare that I have read and understood the clause regarding Restrictions under Rule 144(xi) of the General Financial Rules (GFRs) 2017 on grounds of Defense of India and National Security issued vide OM cited at reference 2 above, on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries.

I, hereby, further certify that our Company is not from such a country which shares a land border with India and in light of conditions & restrictions imposed vide cited OMs, we fulfil all the requirements in this regard to become eligible to be considered in the subject Tender Enquiry by GFGNL.

(Name of the authorized signatory)

Signature
Designation in Company Seal / Stamp of Company
Counter signed by Company Secretary of the Company

9.16 Format XVI (MAF)

Format of MAF/OEM Authorization

AUTHORIZATION CERTIFICATE FROM OEM

Details of Manufacturer Authorization Form (MAF)

The Bidder should submit valid letter (MAF) with undertaking from their OEM(s) whose product is being quoted by the bidder, as per format given below:

Manufacturer Authorization Form

To,
……..,
……..,
……
Subject: Manufacturer Authorizations Letter for Tender Enquiry No.……

Sir,

We, <OEM Name> having our registered office at <OEM address>, hereinafter referred to as OEM are an established manufacturer of the following items quoted by <Bidder Name> having their registered office at <Bidder address>, hereinafter referred to as Bidder:
<name of items>…
……

We <OEM Name> authorize <Bidder's name> to quote our above-mentioned item(s) for above mentioned tender.

We confirm that we have understood the delivery & installation timelines defined in the tender. We confirm that we have worked out all necessary logistics and pricing agreement with <bidder>, and there won't be any delay in delivery, installation and support from our side. Our full support as per pre-purchased support contract is extended/ applicable in all respects for supply, warranty and maintenance of our products. We also ensure to provide the required spares and service support as pre-purchased for the supplied equipment for a period of 10 years (includes 3 years implementation) from date of supply of the equipment as per tender terms. In case, the PMA (GFGNL on behalf DBN/ DoT) requires to extend the period of contract with PIA beyond 10 years, we, as OEM, also undertake to provide support for this extended period also, in case, the supplied product is supported anywhere globally.

In case of any difficulties in logging complaint at bidder end, user shall have option to log complaint at our call support centre.

In case PIA is unable to fulfil the obligations given under this tender, OEM shall be responsible

to complete its obligations towards project with any other PIA appointed by the purchaser.

In case it is required to change authorized agent of OEM, the OEM shall ensure that the alternate Authorized Agent in this case shall abide by all the terms & conditions laid down under the tender/ Contract with the bidder for the quoted OEM products.

In case of PIA exits from the Project for any reason, including but not limited to default, insolvency, termination of its Agreement with the purchaser, or other circumstances resulting in the inability of PIA to fulfill its obligations under the Agreement, OEM shall be obligated to continue providing the services to purchaser in accordance with the terms and conditions outlined in the agreement, between OEM and the bidder including commercials.

We also agree that in case of any default by us in meeting out the obligations as mentioned above, purchaser may debar us for a period upto 3 years.

If any product is declared end of sale/support, we shall proactively ensure that a suitable equivalent or higher roll over product is offered through the PIA to GFGNL for due approval, contract and order executions thereafter.

We understand that any false information/ commitment provided here may result in <OEM's Name> getting blacklisted/debarred from doing business with GFGNL.

We <OEM Name>, hereby provide this undertaking with regard to the Agreement executed between <Name of bidder> and <OEM Name> during the submission of the Bid for <Project Name>

Thanking You

For **<OEM/ Manufacturer name>**

< (Authorized Signatory of OEM)>

Name:

Designation:

Contact Details:
Seal of the
Company
NOTE:

1. The letter should be submitted on the letter head of the manufacturer / OEM and should be counter-signed by the authorized signatory of the bidder.
2. Any deviation would lead to summarily rejection of bid.

9.17 **Format XVII (Letter of authorization for attending bid opening)**

(To be typed preferably on letterhead of the company)

To,

GM, Projects
Gujarat Fibre Grid Network Limited.
Block No: 6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar 382010

Subject: Authorization for attending bid opening on……. (date) in the Tender of…….

I/ We Mr. /Ms…… have submitted our bid for the tender no. …….. in respect of (Item of work) which is due to open on (date).

Following persons are hereby authorized to attend the bid opening for the tender mentioned above on behalf of…….. (Bidder) in order of preference given below.

Order of Preference Name Specimen Signatures
I.

II.

Alternate Representative

Signatures of bidder/ Officer authorized to sign the bid Documents on behalf of the

bidder. Note:

1. Maximum of two representatives will be permitted to attend bid opening. In cases where it is restricted to one, first preference will be allowed. Alternate representative will be permitted when regular representatives are not able to attend.
2. Permission for entry to the hall where bids are opened, may be refused in case authorization as prescribed above is not received.

9.18 **Format XVIII Bidder's / SUPPLIER Profile**

SUPPLIER Particulars for <NIT NUMBER> dated <DD/MM/YYYY>

S. No.	Area of the details to be provided		Responding Firm's/Comp any Details to be provided
1.	Name of the SUPPLIER		
2.	Address of the SUPPLIER		
3.	Telephone number of the Firm/company		
4.	SUPPLIER's RFP number and date		
5.	Name of the contact person to whom all references shall be made regarding this RFP		
6.	Designation of the person to whom all references shall be made regarding this RFP		
7	Address of the person to whom all references shall be made regarding this RFP		
8.	E-mail address of the Firm/company		
9.	Fax number of the Firm/company		
10.	Website address of the Firm/company		
11.	Details of Registration	1.Registration Number of the Firm/company 2.Name of the place where the firm/company was registered 3.Date when the company was registered 4. Product /Service for which registered 5. Validity Period, if applicable	
12.	Goods and Service Tax Registration No. (GST No.)		
13.	PAN No.		

S. No.	Area of the details to be provided	Responding Firm's/Comp any Details to be provided
14.	Average Annual Turnover for the last three (3) audited financial Years (2022-23, 2023-24, 2024-25 or 2023-24, 2024-25, 2025-26 Unaudited)	
15.	Details of ownership of the firm (Name and Address of the Board of Directors, Partners etc.)	
16.	Name of the authorized signatory who is authorized to quote in the RFP and enter into the Contract (Power of Attorney to be submitted)	
17.	Name of the Bankers along with the branch (as appearing in MICR cheque) & Account #	
18.	Status of Firm/company like Pvt. Ltd. etc.	
19.	Locations and addresses of the offices. 1. The corporate address The official address of the service delivery centre.	
20.	Name and contact details of the Project Manager 1. Name of the Project Manager assigned for Contact details viz; telephone number, official address of the Project Manager assigned.	

Witness:

Signature ----------

Name ----------

Address ----------

Date ----------

SUPPLIER:

Signature ----------

` Name ----------

Designation ----------

Company Seal ----------

Date ----------

[SIGN OF BIDDER]

9.19 Format XIX Declaration Proforma-2 UNDERTAKING & DECLARATION

For understanding the terms & condition of Tender & Specifications of work

a) Certified that:

1. I/ We have read, understood, and agreed with all the terms and conditions, specifications included in the tender documents & offer to execute the work at the rates quoted by us in the tender form.

2. if I/ We fail to enter into the agreement & commence the work in time, the EMD/ SD deposited by us will stand forfeited to GFGNL.

3. no addition/ deletion/ corrections have been made in the terms & conditions of downloaded tender enquiry document and bid is being submitted against tender enquiry document which is identical to the tender document appearing on tender Portal.

b) The tenderer hereby covenants and declares that:

1. All the information, documents, photo copies of the documents/ certificates enclosed along with the tender offer are correct.

2. If anything is found false and/or incorrect and/or reveals any suppression of fact at any time, GFGNL reserves the right to debar our tender offer/ cancel the LOA/ Purchase/ work order if issued and forfeit the EMD/ SD/ Bill amount pending with GFGNL. In addition, GFGNL may debar the contractor from participation in its future tenders.

c) In addition to above, it is certified that I/ We have also understood the following from perspective of network design:

1. That the existing made over GPs working on satellite are covered under new GP creation

2. That the existing BSNL fibre taken on lease under BharatNet Phase– I from Block to FPOIs shall no more be part of BharatNet network once the network is upgraded to ring architecture in that Block.

3. That the planning of OFC in ring architecture shall be based on optimal feasible path.

4. That the conditions of field trial for the Class I/ Class II local suppliers of routers shall be applicable.

Date: ……

Signature of Authorized signatory Place: ……
Name of bidder Along with date & Seal

9.20 **Format XX Affidavit for TSP / ISP Compliance**

Affidavit for TSP / ISP Compliance

(To be submitted by the Sole bidder/ Lead Bidder and each Consortium Partner, separately on a non-judicial stamp paper of Rs. 100/-)

1. We, ……..., hereby declare and confirm that on the date of bid submission, we were complying to the tender eligibility conditions as mentioned in the subject RFP No. …….. dated ……
2. Accordingly, we hereby declare the following:

i. That we are not holding any ISP/ TSP license/authorization, covering Gujarat State.
ii. We are not having more than 50% stake in our company of any other company who is holding ISP/ TSP license/authorization covering Gujarat State.
iii. We are not having more than 50% stake in any other such company who is holding ISP/ TSP license/authorization covering Gujarat State.
iv. We are not a subsidiary of a parent company who is holding ISP/ TSP license/authorization covering Gujarat State.

We,……,also undertake and confirm that we shall obtain prior approval of GFGNL, in case we or any of our associate / parent company (falling under any of the above categories) intends to obtain ISP/TSP License/authorization / provide ISP/TSP service, during the contract period under the referred tender, in ~~Odisha~~ Gujarat State, if awarded.

We, , also unconditionally undertake that in case of any of the above fact is found to be incorrect, our bid/agreement may be cancelled / terminated and, any further action by GFGNL/DBN DOT as per tender terms & conditions of the RFP shall be acceptable to us, without any liability on GFGNL/DBN.

We also understand that any suppression of information or breach of our undertaking herein would entitle GFGNL to take any action in accordance with law, including but not limited to civil and criminal law.

For ……..

(Signature, name, designation and address)

9.21 **Format XXI Self-declaration regarding Local Content (LC) for Telecom Product**

FORM-1

Format for Self-declaration regarding Local Content (LC) for Telecom Product, Services or Works to be submitted on non-judicial stamp paper of the value Rs. 100/-

Date:

I, ... S/o, D/o, w/o ....., Resident of ..... do hereby solemnly affirm and declare as under.

That I agree to abide by the terms and conditions of Department of Telecommunications, Government of India issued vide Notification No. ..... dated.....
That the information furnished hereinafter is correct to best of my knowledge and belief and I undertake to produce relevant records before the procuring entity or any other authority so nominated by the department of Telecommunications, Government of India for the purpose of assessing the LC.

Percentage of LC claimed:……..%

That the LC for all inputs which constitute the said Telecom Product/Services/Works has been verified by me and I am responsible for correctness of the claims made therein.

That in the event of the LC of the Telecom Product/Services/Works mentioned herein is found to be incorrect and not meeting the prescribed LC norms, based on the assessment of an authority so nominated by the Department of Telecommunications, Government of India and **I and my Statutory auditor or cost auditor (if applicable) will be liable for actions as specified in Clause (9) of the DPIIT PPP-MII Order dated 19.07.2024 for all incorrect/false facts and figures.**

I agree to maintain detailed breakup / information (separately for each product) to substantiate my claim for LC in the Company's record for a period of 2 years and shall make this available for verification to any authority. I shall also maintain records of local content pertaining to items bought from other domestic manufacturers / traders.

[Please provide following information]

i. Name and details of the Local supplier (Registered Office, Manufacturing unit location, nature of legal entity)
ii. Date on which this certificate is issued.

iii. Telecom Product/Services/Works for which the certificate is produced.

iv. Procuring agency to whom the certificate is furnished.

v. Percentage of LC claimed.

vi. Name and contact details of the unit of the manufacturer.

vii. Sale price of the product.

viii. Ex-Factory Price of the product.

ix. Freight, insurance and handling

x. Total Bill of Material.

xi. List and total cost value of inputs used for manufacture of the Telecom Product/Services/Works.

xii. List and total cost of inputs which are locally sourced. Please attach LC certificate from local suppliers, if the input is not in-house.

xiii. List and cost of inputs which are imported, directly or indirectly.

I hereby certify that, having read all the provisions of the above order and principles / basis of calculations, the local content calculation does not include the following:

a) Imported items sourced locally from resellers/distributors.
b) The license fees / royalties paid/ technical charges paid out of India
c) Procurement / supply of repackaged / refurbished/rebranded imported products

I hereby also certify to the best of my knowledge and belief that all the particulars furnished above are correct and complete. I agree to comply with the terms and conditions of the DPIIT PPP-MII order dated 19.07.2024 and DoT PPP-MII Notification dated……

I understand that any incorrect declaration regarding the local content or failure to substantiate the claim of LC will result in penalties as specified in Clause (9) of the DPIIT PPP-MII Order dated 19.07.2024.

[SIGN OF BIDDER]

I further certify and take personal responsibility that I have applied my mind to the calculations and principles of LC as specified in this order and I shall, having declared the LC shall not seek recourse to change it on any ground. Any changes made by me on any grounds in a bid in LC after bid submission shall make my bid non-responsive and I shall hold myself liable for civil/criminal action arising out of any such change. I understand and agree that any such post bid change in LC content shall also be a valid ground for blacklisting of the firm from future contracts/bids.

~~**StatutoryAuditor**~~
~~**Signature:**~~
~~**Name:**~~
~~**Designation:**~~
~~**Address:**~~
~~**Email**~~
~~**Address:**~~
~~**Mobile No.:**~~
~~**Place:**~~
~~**Date:**~~

Signature:
Name:
Designation:
Address:
Email
Address:
Mobile No.:
Place:
Date:

9.22 Format XXII: Summary of Experience Certificate in Excel Format

S. No.	EPC work (Supply, Laying, Installation, Testing and Commissioning) of OFC (UG of at least 24 F)	Organization Name, Place and Address	PO No and Date	Completion certificate No, Date & Name, Designation, email, mobile No of Issuing Authority	Quantity/ RKM	Year (Period) of completion of work	Reference Page No in Bid documents (from - to)
1							
2							
3							

S. No.	O&M of OFC Network (UG of at least 24 F)	Organization Name, Place and Address	PO No and Date	Completion certificate No, Date & Name, Designation, email, mobile No of Issuing Authority	Quantity/ RKM	Year (Period) of completion of work	Reference Page No in Bid documents (from - to)
1							
2							
3							

Sr. No.	Telecom Equipment Installation & Commissioning	Organization Name, Place and Address	PO No. and Date	Completion certificate No, Date & Name, Designation, email, mobile No of Issuing Authority	No.	Year (Period) of completion of work	Reference Page No in Bid documents (from -to)
1							
2							
3							

Note: Similar format is to be used by the bidder for providing details of supply and/or installation/commissioning of quoted make/model wherever required as per the requirement in this document.

Signature of the Bidder
With date and seal

9.23 **Format XXIII Summary of Turnover/ Networth of the Bidders in Excel Format**

Details of Turnover of bidders as per bid documents

S. No.	Name of the Bidder / Consortium member	Required Minimum Average Annual Turnover (Rs. Crore)	Turnover of bidder as per bid documents (Rs. Crore) (Strike whichever is not applicable)			Average Annual Turnover	Reference Page No in Bid documents (from - to)	Remarks
			2022-23 OR 2023-24	2023-24 OR 2024-25	2024-25 OR 2025-26(Unaudited)			
1								

Details of Net Worth of bidders as per bid documents

S. No.	Name of the Bidder / Consortium member	Required Minimum Net Worth (Rs. Crore)	Net worth of bidder as per bid documents (Rs. Crore) (Strike whichever is not applicable)			Reference Page No in Bid documents (from - to)	Remarks
			2022-23 OR 2023-24	2023-24 OR 2024-25	2024-25 OR 2025-26(Unaudited)		
1							

9.24 **Format XXIV- Check list**

Check list of documents to be submitted by the bidder in excel format

#	Particulars of documents to be submitted	Page No and Documents	Comment
	Off Line Bid Documents		
1	Demand Draft in favour of GFGNL, drawn on any nationalized / scheduled bank and payable at Ahmedabad/Gandhinagar, submitted towards tender fee/ cost of the tender documents.		

#	Particulars of documents to be submitted	Page No and Documents	Comment
2	A proof regarding registration of MSE (Micro & Small Enterprises) with Appropriate Authority, if claiming		
3	Original copy of the Bid Security		
	Techno Commercial Bid Documents		
4	Scanned copy of "Demand Draft in favour of Gujarat Fibre Grid Network Limited, drawn on any nationalized/ scheduled bank and payable at Ahmedabad/Gandhinagar, Gujarat, towards tender fee/ cost of the tender		
5	Scanned copy of proof regarding registration of MSE (Micro & Small Enterprises) with Appropriate Authority, if claiming exemption in tender fee or Bid Security		
6	Scanned copy of the Bid Security		
7	Declaration that no addition/deletion/ corrections have been made in the downloaded tender document being submitted and it is identical to the tender document appearing on tender Portal and all amendments /corrigendum/ clarifications issued by		
8	Non-Relation Certificate duly signed by all Directors		
9	Bid form duly filled & signed		
10	List of all Directors including their name(s), Director Identification Number(s) (DIN) and address (es)along with contact telephone numbers of office and residence.		
11	Undertaking duly signed by the bidder stating that it shall be liable for due performance of the contract		
12	A signed undertaking from Authorized Signatory of the bidder certifying that all components/ parts/ assembly/ software used in the Desktops and Servers like Hard disk, Monitors, Memory etc. shall be original, new components/ parts/ assembly/ software and that no refurbished/ duplicate/second hand components/		
13	For supply of any software i.e. operating system or any applications software the bidder should submit a Certificate Of Authenticity (COA), issued by the respective OEM and duly signed by Authorized Signatory of the bidder stating that all Software supplied are authentic and legal		
14	Clause-by-clause compliance. In case of deviations, a statement of the deviations and exception to the provision of the Technical Specifications and Commercial Conditions shall be given by the bidder		
15	Scanned copy of notarized Power of Attorney for signing the bid document and authorization for executing the power of attorney as per clause 14.4 of Section II along with Attestation of the specimen signatures of such authorized		
16	Integrity Pact		
17	Certificate of Incorporation and Memorandum & Article of Association		

#	Particulars of documents to be submitted	Page No and Documents	Comment
18	Self-attested Copy of PAN & GSTIN registration		
19	Completion Certificate issued & signed by the competent authority of the client entity along with the supporting documents such as Work order/ Purchase order OR Contract clearly highlighting the scope of work Bill of		
20	Undertaking from the bidder as per format given that bidder is not blacklisted/ debarred with Ministry of Communication or GFGNL or debarring order issued by Department of Expenditure (DOE), Ministry of Finance (MOF) covering all central Ministries/ Departments as per provision of OM No.F.1/20/2018-PPD by Department of Expenditure (DoE),		
21	Audited/ Unaudited financial statements for networth and average annual turnover as per eligibility criteria		
22	Certificate from the Statutory Auditor for networth and average annual turnover for the financial year preceding the Bid Date as per eligibility criteria		
23	Copies of valid TSEC/ TAC or proof of having applied for TSEC/ TAC (BSNL registered QF-103 or TEC Form-B) for		
24	A Self-declaration for not being declared as non- performer in any DIGITAL BHARAT NIDHI(DBN) project(s),		
25	Undertaking in the form of an affidavit, to be submitted by the bidder and consortium partners (if any), in the format given		
26	Joint bidding agreement, if Bidder is a consortium member		
27	Form-1 as per annexure format for Self-declaration regarding Local Content (LC) for Telecom Product,		
29	Land border sharing if bidder is from a country which shares land border with India		
30	In case of imported products, certificate from OEM that it has a registered office and Service Support Centre in India to provide after sales service support in India.		
31	Unpriced detailed BOM		
32	Letter of Authorization for attending bid opening		
33	Manufacturer Authorization Form (MAF)		
34	Bidders /Supplier profile & questionnaire duly filled & signed as per format		
35	Undertaking & declaration duly filled & signed (Certificate for having understood the terms & conditions of tender and		
36	Detailed summary of experience certificate (EPC work and O&M of IFC network) in excel format		

#	Particulars of documents to be submitted	Page No and Documents	Comment
37	Detailed summary of turnover/ net worth details in excel format		

Notes:

I. All the pages of bid documents should be numbered and arranged accordingly. The Bidder shall combine all the bid documents in the order, before uploading, as mentioned in the table above.

II. All other documents which are not mentioned in the table above but are required against any of the clause of RFP are necessarily to be submitted to make the bid compliant. These other documents shall be placed after the documents mentioned in the table above, while numbering and arranging the documents.

III. The bid documents (to be uploaded on the e-tendering portal) should be numbered in order of Check list in Annexure. An index in first folder with file names should be submitted for easy location.

9.25 Format-XXV: Joint Bidding Agreement

(To be executed on Stamp paper of appropriate value)

THIS JOINT BIDDING AGREEMENT is entered into on this the …… day of …… 20…

AMONGST

1. ……. Limited, a company incorporated under the Companies Act, 1956/2013 and having its registered office at ……. (hereinafter referred to as the "First Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

AND

2. ……. Limited, a company incorporated under the Companies Act, 1956/2013 and having its registered office at ……. (hereinafter referred to as the "Second Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

AND

3. ……. Limited, a company incorporated under the Companies Act, 1956/2013 and having its registered office at ……. (hereinafter referred to as the "Third Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

WHEREAS

,

(A) Gujarat Fibre Grid Network Limited having its head office at" Block No.6, 5th Floor, Udyog Bhavan, Sector-11, Gandhinagar-382011, Gujarat, India" (hereinafter referred to as the "GFGNL" which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns) has invited applications (the Bids") by its Request for Proposal No. …… dated …… (the "RFP") for selection of Bidder for Development (Creation, Upgradation and Operation & Maintenance) of BharatNet through Design, Build, Operate and Maintain (DBOM) Model in the Licensed Service Area of State/UT name on Design, Build, Operate and Maintain (DBOM) Model (Package XX) (the"Package").

(B) The Parties are interested in jointly bidding for the package as members of a Consortium and in accordance with the terms and conditions of the RFP document and other Bidding Documents in respect of the package, and It is a necessary condition under the RFP document that the members of the Consortium shall enter into a Joint Bidding Agreement and furnish a copy thereof with the Bid.

NOW IT IS HEREBY AGREED as follows:

1. Definitions and Interpretations

In this Agreement, the capitalized terms shall, unless the context otherwise requires, have the meaning ascribed thereto under the RFP.

2. Consortium

2.1 The Parties do hereby irrevocably constitute a consortium (the "Consortium") for the purposes of jointly participating in the Bidding Process for the package.

2.2 The Parties hereby undertake to participate in the Bidding Process only through this Consortium and not individually and/ or through any other consortium constituted for this package, either directly or indirectly or through any of their Associates.

3. Covenants

The Parties hereby undertake that in the event the Consortium is declared the selected Bidder and awarded the package, the Lead Member shall enter into a Contract Agreement with the GFGNL and for performing all its obligations as the PIA in terms of the Contract Agreement for the package.

4. Role of the Parties

The Parties hereby undertake to perform the roles and responsibilities as described below:

(a) Party of the First Part shall be the Lead member of the Consortium and shall have the power of attorney from all Parties for conducting all business for and on behalf of the Consortium during the Bidding Process and until the expiry of the Defects Liability Period under and in accordance with the Contract Agreement;
(b) Party of the Second Part shall be {the Technical Member of the Consortium;
(c) Party of the Third Part shall be {the Technical Member of the Consortium;

5. Joint and Several Liability

5.1 The Parties do hereby undertake to be jointly and severally responsible for all obligations and liabilities relating to the package and in accordance with the terms of the RFP and the Contract Agreement.

5.2 The Parties do hereby undertake and declare that the Lead Member shall represent all the members of the Consortium and shall at all times be liable and responsible for discharging the functions and obligations of the Consortium; and that each member of the Consortium shall be bound by any decision, communication, notice, action or inaction of the Lead Member on any matter related to this Agreement and the GFGNL shall be entitled to rely upon any such action, decision or communication of the Lead Member. The GFGNL shall have the right to release payments solely to the Lead Member and shall not in any manner be responsible or liable for the inter se allocation of payments among members of the Consortium.

6. Representation of the Parties

Each Party represents to the other Parties as of the date of this Agreement that:

(a) Such Party is duly organised, validly existing and in good standing under the laws of its incorporation and has all requisite power and authority to enter into this Agreement;

(b) The execution, delivery and performance by such Party of this Agreement has been authorised by all necessary and appropriate corporate or governmental action and a copy of the extract of the charter documents and board resolution/ power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member is annexed to this Agreement, and will not, to the best of its knowledge:

i. require any consent or approval not already obtained;
ii. violate any Applicable Law presently in effect and having applicability to it;
iii. violate the memorandum and articles of association, by-laws or other applicable organisational documents thereof;
iv. violate any clearance, permit, concession, grant, license or other

governmental authorisation, approval, judgement, order or decree or any mortgage agreement, indenture or any other instrument to which such Party is a party or by which such Party or any of its properties or assets are bound or that is otherwise applicable to such Party; or

v. create or impose any liens, mortgages, pledges, claims, security interests, charges or encumbrances or obligations to create a lien, charge, pledge, security interest, encumbrances or mortgage in or on the property of such Party, except for encumbrances that would not, individually or in the aggregate, have a material adverse effect on the financial condition or prospects or business of such Party so as to prevent such Party from fulfilling its obligations under this Agreement;

(c) this Agreement is the legal and binding obligation of such Party, enforceable in accordance with its terms against it; and

(d) there is no litigation pending or, to the best of such Party's knowledge, threatened to which it or any of its Associates is a party that presently affects or which would have a material adverse effect on the financial condition or prospects or business of such Party in the fulfilment of its obligations under this Agreement.

8. Termination

This Agreement shall be effective from the date hereof and shall continue in full force and effect until the expiry of the Defects Liability Period under the Contract Agreement, in case the package is awarded to the Consortium. However, in case the Consortium is either not qualified for the package or does not get selected for award of the package, the Agreement will stand terminated in case the Bidder is not qualified or upon return of the Bid Security by the GFGNL to the Bidder, as the case may be.

9. Miscellaneous

9.1 This Joint Bidding Agreement shall be governed by laws of India.

9.2 The Parties acknowledge and accept that this Agreement shall not be amended by the Parties without the prior written consent of the GFGNL

IN WITNESS WHEREOF THE PARTIES ABOVE NAMED HAVE EXECUTED AND DELIVERED

THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED

SIGNED, SEALED AND DELIVERED

AND DELIVERED

Notes:

1. The mode of the execution of the Joint Bidding Agreement should be in accordance with the procedure, if any, laid down by the Applicable Law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.
2. Each Joint Bidding Agreement should attach a copy of the extract of the charter documents and documents such as resolution / power of attorney in favor of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member.
3. For a Joint Bidding Agreement executed and issued overseas, the document shall be legalised by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney has been executed.

9.26 Format-XXVI: for essential information for applying to NSCS

(Trusted Telecom Portal)

1	Project Name		:		
2	Type of Project		:	1. New Roll Out 2. Expansion 3. Upgrade	
3	Are your procurements from India registered vendor only for this project?		:	o Yes o No	
4	Do you intend to procure from non- India registered vendor for this project?		:	o Yes o No	
5	Remarks on the Project Criticality, if any,				
6	Details of Equipment:				
	Asset (one to be selected)	Equipment Name	Company Name/Vendor	Product Name	Model Name
	a) Support System b) Transport		Name of Contact person: E-mail ID: Mobile No.		

9.27 Format-XXVII: Non-Disclosure Agreement (NDA)

Ref: Date:

To
Chief Finance Officer (CFO)
Gujarat Fibre Grid Network Limited (GFGNL),
Block No: 6, 5th Floor,
Udyog Bhavan,
Sector-11, Gandhinagar -382010

Dear Sir,

Confidentiality Agreement

We acknowledge that during providing services to [name of client] ("you" or "Company") pursuant to [scope of services] ("Engagement") we shall have access to and be entrusted with Confidential Information. In this letter agreement ("Agreement"), the phrase "Confidential Information" shall mean information (whether of a commercial, technical, scientific, operational, administrative, financial, marketing, business, or intellectual property nature or otherwise), whether oral or written, relating to you and your business that is provided to us pursuant to the <work order no. & date>.

In consideration of you making Confidential Information available to us, we agree to the terms set out below:

1. We shall treat all Confidential Information as strictly private and confidential.
2. We shall use the Confidential Information solely for the Engagement.
3. We shall not disclose Confidential Information to any third party other than those permitted by clause 4 below.

4. This Agreement shall not prohibit disclosure of Confidential Information:

    i. to our partners, directors, associates, affiliates, agents, subcontractors and employees ("Engagement Team") who need to know such Confidential Information to perform and assist with the Engagement.
    ii. to our partners, directors, associates, affiliates and /or such other parties who facilitate the administration of our business or support our infrastructure in both cases (a) in order to perform client and engagement acceptance procedures (including but not limited to the identification of potential conflicts of interest or compliance with independence requirements), (b) for purposes of internal risk assessments and (c) to support the maintenance of quality and professional standards in the delivery of services (e.g. through the involvement of professional practice and policy departments, the participation in quality assurance measures or the establishment and maintenance

of knowledge databases). However, we shall remain responsible for preserving confidentiality if Confidential Information is shared with or accessed by parties mentioned herein.

iii. with your prior written consent, such consent not to be unreasonably withheld.
iv. to the extent that such disclosure is required by any law, rule or regulation.
v. to our professional indemnity insurers and advisors in which event we shall do so in confidence only.

5. You shall inform us in writing if, during the Engagement, the Engagement Team will have access to any unpublished price sensitive information, whether of the Company or any other entity. You agree that we shall not be responsible for determining the difference between price sensitive and non-price sensitive information that would form part of the information disclosed to us. All information supplied to us (in whatever form) which is not in the public domain will be treated as Confidential Information for the purposes of the Engagement. Further, you shall be responsible to obtain legal advice to ensure that information disclosed to us is not in contravention of any applicable laws and regulations.

6. Upon your written request we shall arrange delivery to you of the Confidential Information received from you, that is in documentary or other tangible form, except:

i. retention required for a disclosure permitted by clause 4 (iii) above; and
ii. to the extent that we require to retain sufficient documentation that is necessary to support any advice, reports, or opinions provided by us.

The documentation retained will continue to be subject to confidentiality obligations set out in this Agreement.

7. This Agreement shall not apply to Confidential Information that:

i. is in the public domain at the time it is acquired by us or enters the public domain after that, otherwise than as a result of unauthorized disclosure by us.
ii. is already in our possession prior to its disclosure to us.
iii. becomes lawfully available to us from a third party whom we believe to be free from any confidentiality restriction.
iv. is independently developed by us or for us without reference to your Confidential Information.

8. This Agreement shall continue for two years from the date of this Agreement unless and to the extent that you may release it in writing. Where any definitive agreement is executed in connection with the Engagement, this Agreement shall be read together with the definitive agreement and be governed by the same.
9. We warrant that we are acting as principal in this matter and not as agent or broker for any person, company, or firm.
10. We acknowledge that no failure or delay by you in exercising any right, power, or privilege under this Agreement shall operate as a waiver thereof, nor shall any single or partial exercise thereof or the exercise of any other right, power, or privilege. Except for the contracting parties to this Agreement, no third party shall have any right to enforce or rely on any provision of the

Agreement. In no event shall either party be liable for any indirect or consequential losses or damages.

11. This Agreement shall be governed by and construed in accordance with Indian laws without reference to the conflicts of laws principles and any dispute arising from it shall be subject to the exclusive jurisdiction of the courts in Ahmedabad/Gandhinagar, India.
12. I hearby declare that I meet all the Criteria and the information provided by us is true. At any point of time if GFGNL found that information provided is incorrect or false in nature then they may cancel our proposal and may blacklist.

With kind regards

Yours sincerely

For (Insert the Entity Name)

Partner / Executive Director / Director

Agreed and Accepted For (Insert Client Name)

Signature:

Name:

Title/position:

Date:

Seal:

9.28 Format: XXVIII: Undertaking for Non Legal Matter under Subjudice
(To be signed by Sole or Lead bidder and consortium members (in case of consortium)

Reference 1: GFGNL Tender No._____

I, in capacity of authorized signatory of M/s …….. (as a lead bidder and M/s ……. as a consortium member(to be deleted if participated as sole bidder))having Regd. office at …… (and regd. Office at ……..(participated as consortium member) being a participant bidder/s in GFGNL tender at reference 1 above, hereby declare that as on bid date we do not have any dispute/legal matters under sub judice/ decided with GFGNL, Department of Science & Technology(DST),GFGNL, Department of Telecommunications(DoT) and BSNL for Amended Bharat Net Tender floated by BSNL in February 2024. The summary of dispute/legal matter related to above is as below for information,

Sl	Dispute/legal matter name	Organization Name	Brief Description	Status

I, hereby, further certify that above declaration is correct and we fulfil all the requirements in this regard to become eligible to be considered in the subjected tender Enquiry by GFGNL.

Dated this ..... day of …… 20...
Name and Signature In the capacity of
Duly authorized to sign the bid for and on behalf of bidder(Sole or lead bidder)
Witness Address.....
Signature

Dated this ..... day of …… 20...
Name and Signature In the capacity of
Duly authorized to sign the bid for and on behalf of bidder(applicable for consortium member)
Witness Address.....
Signature

9.29 **Format: XXIX Clause-By-Clause Compliance**

Subject – Clause by clause compliance for Tender Enquiry No. ……..Dated …….

We, M/s ....., the bidder for Tender Enquiry No. …… dated ……., do hereby undertake and confirm that we have complied with all sections and clauses of the Tender Documents, including all clarifications, amendments, and addenda issued thereto up to date of bid submission.

Furthermore, we, M/s....., hereby confirm that there are no deviations in our technical and commercial bids with respect to the above-mentioned Tender. We are submitting our clause-by-clause compliance as below:

Sl. No.	Section No	Details	Remark for compliance (All clauses of this section are compiled)
1	I	Key Information & Introductions	All clauses of this section are complied and there is no deviation.
2	II	Introduction & objective	All clauses of this section are complied and there is no deviation.
3	III	Eligibility criteria	All clauses of this section are complied and there is no deviation.
4	IV	Instructions to bidders	All clauses of this section are complied and there is no deviation.
5	V	Scope of work	All clauses of this section are complied and there is no deviation.
6	VI	Project timelines	All clauses of this section are complied and there is no deviation.
7	VII	Service level agreement (sla) & penalty	All clauses of this section are complied and there is no deviation.
8	VIII	Financial bid	All clauses of this section are complied and there is no deviation.
9	IX	Annexures & formats	All clauses of this section are complied and there is no deviation
10	X	Special technical conditions (Technical specifications)	All Clauses of the Technical specifications and other specifications for tender items are complied and there is no deviation. Technical literatures of the offered items are also submitted with the bid.
11	-	All clarifications/ amendments/ Addenda, issued against the subject Tender Enquiry document	All clarifications/ amendments/ Addenda, issued against the subject tender, are complied and there is no deviation.

Note: In case of any deviations, a statement detailing the deviations and exceptions to the provisions of the Technical Specifications and Commercial Conditions shall be provided by the bidder.

Signature of Authorized Signatory
Designation in Company Seal / Stamp of Company

9.30 **Format-XXX: Undertaking regarding Common Ownership and Control**

(To be submitted by the Sole bidder/ Lead Bidder and each Consortium Partner, separately on Company's Letter Head)

1. We, …[Company's name]..., hereby solemnly declare and confirm that we have carefully read, understood, and complied with the eligibility conditions including the conditions relating to restriction on participation and award of work defined in the Tender Document.

2. In accordance with the above, we hereby declare and confirm as under:

   i. That no company having common ownership or control with us, as defined in the Tender Document, is participating in this tender, either as a sole bidder or a member of any consortium.

3. We, …[Company's name]...,, further unconditionally undertake that, in the event any of the above declaration is found to be false, incorrect, misleading, or suppressed at any stage, our bid and/or agreement shall be liable to be cancelled or terminated, and GFGNL/DBN/DoT shall be entitled to take any further action as per the terms & conditions of the RFP, without any liability on GFGNL/DBN/DoT.

4. We also acknowledge and understand that any suppression of material information or breach of this shall render us liable for appropriate action in accordance with law, including but not limited to actions under civil and/or criminal law.

Signature of Authorized Signatory Designation in Company Seal / Stamp of Company

9.31 ANNEXURE-XXXI – Unconnected Gram Panchayat List in Gujarat
Enclosed

9.32 ANNEXURE-XXXII – List of Gram Panchayats to be upgraded from Linear to Ring
Enclosed

9.33 ANNEXURE-XXXIII – List of Sub-blocks where BSNL Exchange to be use or new shelter Infrastructure to be constructed
Enclosed

9.34 ANNEXURE-XXXIV – List of Sub-blocks where Existing shelter Infrastructure to be upgraded
Enclosed

9.35 ANNEXURE-XXXV – List of Revenue villages to be connected on demand basis
Enclosed

9.36 ANNEXURE-XXXVI – List of existing ICT and Non-IT Inventory
Enclosed

9.37 ANNEXURE-XXXVII – Sizing of existing EMS, NMS and GIS for GFGNL
Enclosed

9.38 ANNEXURE-XXXVIII – List of Existing Network Inventory for BharatNet Phase-I and Phase-II
Enclosed

9.39 ANNEXURE-XXXIX – List of Other Sites connected under existing BharatNet Phase-I and Phase-II

Enclosed

9.40 ANNEXURE-XXXVIII – List of Network Inventory of BharatNet Phase-II Shelter

Enclosed

9.41 ANNEXURE XXXIX: Existing Shelter Inventories for AMC is required.

#	Line Items Description		UoM	Pkg-A (Qty)	Pkg-B (Qty)
1	AMC of Servo Stabilizer	AMC of Sarthi ABC Power Systems (10 Yrs AMC will be applicable from award of contract)-Single Phase-7.5KVA	Nos	17	0
2	AMC of Servo Stabilizer	JV industrial technology (10 Yrs AMC will be applicable from award of contract)-Single Phase-10KVA	Nos.	0	10
3	AMC of Servo Stabilizer	UNITOP Single Phase Air Cooled IP55 Servo Stabilizer) (10 Yrs AMC will be applicable from award of contract)-Single Phase-10 KVA	Nos.	34	94
4	AMC of Servo Stabilizer	RSPower (9 Yrs AMC will be applicable after expiry of current AMC)-1Phase 10 KVA	Nos.	125	54
5	AMC of Servo Stabilizer	RSPower (9 Yrs AMC will be applicable after expiry of current AMC)-3Phase 16KVA	Nos.	4	17
6	Existing Shelter AMC	AMC of existing Shelter/Porta cabin including 2TR Twin circuit without FCU Commercial Grade Air Conditioner, SMPS , 80Amp(1+1)/ 50 Amp(1+1+1) rectifier module, 1 set up of 600 AH (VRLA) Battery bank,and all other active and passive accessories integrated in the existing Shelter	Nos.	204	179
7	Strategic Sites (TC/DC)	AMC of strategic location (without porta cabin/shelter sites) including SMPS , 80Amp(1+1)/ 50 Amp(1+1+1) rectifier module, 1 set up of 600 AH (VRLA) Battery bank, Split AC 2Ton(2), Split AC controller Module, and all other active and passive accessories integrated in the existing Shelter	Nos.	23	3

#	Line Items Description		UoM	Pkg-A (Qty)	Pkg-B (Qty)
8	Strategic locations where Repair/replacement required	AMC and repair/ replacement of existing Shelter/Porta cabin including 2TR Twin circuit without FCU Commercial Grade Air Conditioner, SMPS , 80Amp(1+1)/ 50 Amp(1+1+1) rectifier module, 1 set up of 600 AH (VRLA) Battery bank,and all other active and passive accessories integrated in the existing Shelter	Nos.	0	2

Existing Inventories of Servo Stabilizer (Only AMC is required)

Sr No	Rating	OEM	Warranty (already taken) (In Years)	Nos	Contract start
1.	7.5 KVA	Sarthi ABC Power Systems	1	17	Old supply
2.	10 KVA	JV industrial technology	1	10	Old supply
3.	10 KVA	UNITOP Single Phase Air Cooled IP55 Servo Stabilizer)	1	60	02-Jul-22
4.	10 KVA	UNITOP Single Phase Air Cooled IP55 Servo Stabilizer)	3	17	16-Feb-23
5.	10 KVA	UNITOP Single Phase Air Cooled IP55 Servo Stabilizer)	3	17	26-Dec-22
6.	10 KVA	UNITOP Single Phase Air Cooled IP55 Servo Stabilizer)	3	17	01-Mar-23
7.	10 KVA	UNITOP Single Phase Air Cooled IP55 Servo Stabilizer)	3	17	06-Feb-23
8.	10 KVA	RS Power	3	179	13-Sep-23
9.	3*16 KVA	RSPower	3	21	13-Sep-23

9.42 ANNEXURE XXXX : Existing Shelter AMC Details which includes active and passive infrastructures built under shelter

Year Of Expiry	AMC Expiry Month	Package-A	Package-B	Grand Total
2025	Jan		2	2
2027	Jun	1	1	2

Year Of Expiry	AMC Expiry Month	Package-A	Package-B	Grand Total
	Jul	1	2	3
	Aug	3		3
	Sep	1		1
	Oct	1	8	9
	Nov	5	9	14
	Dec		1	1
2028	Jan	1		1
	Feb	1	5	6
	Mar		4	4
	Aug	3	3	6
	Sep	2	3	5
	Oct	9	18	27
	Nov	9	9	18
	Dec	8	19	27
2029	Jan	9	12	21
	Feb	9	8	17
	Mar	15	12	27
	Apr	10	15	25
	May	15	2	17
	Jun	3		3
	Jul	8	1	9
	Aug	13	11	24
	Sep	10	7	17
	Oct	9	1	10
	Nov	8		8
	Dec	7	9	16
2030	Jan	4	6	10
	Feb	3	3	6
	Mar	10	2	12
	Apr	6		6
	May	9		9
	Jun	4	1	5
	Jul	4		4
	Aug	3	3	6
	Oct		1	1
2031	Feb		1	1
Grand Total		**204**	**179**	**383**

Existing Strategic Sites (TC/DC) AMC Expiry details

Year of AMC Expiry	Month	Package- A	Package-B
2027	Jan	1	
	Oct	4	
	Dec	14	
2027 Total		19	
2028		4	3
Grand Total		23	3

Key Notes against Annexure: XVII

The matrix referred to above represents the existing line items procured under the existing BharatNet Phase-II Shelter Infrastructure project. The selected bidder shall be required to provide comprehensive Annual Maintenance Contract (AMC) support for these items throughout the entire contract duration. Alternatively, the bidder may replace the existing inventory through an agreed and suitable mechanism. In all cases, the bidder must ensure strict adherence for achievement of the defined Service Level Agreements (SLAs) and Key Performance Indicators (KPIs).

9.43 ANNEXURE XXXXI: Phase-I(Existing BSNL Exchange) and Phase-II(Existing Shelter)

Phase 1			Phase 2	
Name	**Proposed Counts**		**Name**	**Existing Counts**
AMRELI	26		Ahmedabad	22
Anand	12		Anand	2
Bharuch	26		Aravalli	23
Bhavnagar	20		Banaskantha	42
Botad	5		Bharuch	5
Chhotaudepur	13		Botad	4
Gandhinagar	9		Chhotaudepur	1
Katchh	28		Dahod	20
Kheda	14		Dang	5
Mahisagar	3		Dev-Bhoomi_Dwarka	13
Mehsana	19		Gir Somnath	17
Navsari	10		Jamnagar	18
Patan	17		Junagadh	25
Porbander	6		Kheda	2
Sabarkantha	22		Mahisagar	16
Vadodara	20		Mehsana	6

Valsad	5		Morbi	17
Other	25		Narmda	12
Grand Total	**280**		Navsari	2
			Panchmahal	20
			Patan	2
			Rajkot	31
			Sabarkantha	4
			Surat	34
			Surendranagar	27
			TAPI	13
			Vadodara	10
			Valsad	16
			Grand Total	**410**

9.44 ANNEXURE: XXXXII- Existing NOC inventory details

Sr. No	Item	Make and Model	Unit
1	55inch Full HD LED Video wall Display panel with Extreme Narrow Bezel(1.7mm)	Christie FHD-5S3XE (5x3 mat	15
2	Wall Mount Bracket for above video wall display	Branded	15
3	Video wall controller with 16HDMl input and 24HDM1 output and Video wall management software	Datapath VSN1172-RPSU	1
4	HDMI cable (50mtrs)	Kramer CLS-AOCH/60-164	30
5	LIU - 48 Port X 2	Norden	
6	Fortinet FIREWALL 24 Port	Fortinet 140 POE	1
7	Multiple WAN Router	Cisco 4431	1
8	LAN POE switch - 24 PORT X 2	Allied Telesys	2
9	WIRELESS AP	Netgear	2
10	CAT6 UTP Cable (305mtrs)	Norden	4
11	CAT6 Patch Panel 24port	Norden	
12	CAT6 Patch Cord (1Mtrs)	Norden	48
13	CAT6 Patch Cord (2Mtrs)	Norden	48
14	CAT61/0 Faceplate and Back box	Norden	48
15	Rack mountable PC with 22inch Monitor , Keyboard and Mouse.	~~Advantech~~ Acer	15 PC, 45 Monitors & Keyboard

Sr. No	Item	Make and Model	Unit
16	Industrial Computer, Keyboard, mouse		1
17	42U Rack with two vertical PDU	Valrack	
18	OFC Termination at	OTS	96
19	Installation and commissioning charges	OTS	

Furniture:

Sr. No	Material Description	Size	Qty	Unit
1	Operator Desk 1	750 x 4500 x 750	3	Nos
2	Operator Desk 2	7500 x 3500 x 750	3	Nos
3	Chairs	-	15	Nos
4	Desktop	-	15	Nos

UPS:

Sr. No.	Material Description	Qty.	Unit
1	Supply, installation & Commissioning of Arrow 20 KVA online UPS with 2 Hours battery(EXIDE EP 120-12) backup with 1 year onsite warranty including Battery.	1	Nos.

9.45 ANNEXURE:XXXXIII: List of Sub-block locations

Enclosed

SECTION-10 SPECIAL TECHNICAL CONDITIONS

1. Relevant TEC GRs for Technical specifications of material to be supplied are mentioned in **Annexure- A**.
2. Detailed Technical Specifications of following Network components are mentioned in **Annexure-B**

I. Network
II. Routers
III. eMS of Routers
IV. RFMS
V. Rack at Block and GP
VI. UPS at GP
VII. Telecom grade Shelter (New) and Upgradation of existing shelters
VIII. Unlicensed Band Radio (UBR)
IX. Free Space Optics (FSO) / Light fidelity (Li-Fi)
X. UPS for Gram Panchayat
~~XI. UPS for Villages~~
XII. Mini OLT
XIII. 8.0/ 7.0-meter long RCC pole working load of 115 Kgs
XIV. Armoured Ribbon Optical Fibre Cable for Underground Duct Application

3. Engineering Instructions for Under Ground Optical Fiber Cable Laying Works is attached as **Annexure-C.**
4. Technical Specification for GIS Mapping of OFC Routes is attached as **Annexure-D.**

Annexure A: TECHNICAL SPECIFICATIONS

TEC-GR Standards list:

S. No.	Type of Material	Technical Specifications
1	Armoured Optical Fibre Cable for underground application	TEC GR Standard No.: TEC 85170:2024(For Armoured Optical cable for Underground duct applications) & 85260:2024 (For Ribbon Optical cable for Underground duct applications) **Type of Fibre** : G.652 D fibre with bend insensitive property of (G.657A1)

S. No.	Type of Material	Technical Specifications
2	Armored Optical Fiber Cable for underground application. 24F/48F loose tube	TEC GR Standard No.: TEC 85170:2024 with latest amendments. Although in this TEC/ GR only optical fiber of G.652 D is mentioned but vendor shall have liberty to use G.657A1 also as per ITU-T recommendation.
3	Armored Optical Fiber Cable for underground application. 48F / 96F ribbon	TEC GR/ Standard No.: TEC 85260:2024 with latest amendment. The above-mentioned TEC Standard No. shall supersede The Technical Specifications issued vide Amendment No.– 13 dated 08.05.2024 **Type of Fibre** : G.652 D fibre with bend insensitive property of (G.657A1)
4	Aerial OF Cable (ADSS Cable): 48/24F ADSS on power lines	TEC GR Standard No.: TEC 85190:2022 (Type- A-I semi dry core without ice loading) with latest amendments
5	6F /12F/24F / Aerial Drop Optical Fibre Cable with Installation Accessories (For Last mile applications)	TEC GR Standard No.: TEC 85200:2022 with latest amendments if any
6	Splitters (1:2, 1:4, 1:8, 1:16)	TEC GR Standard No.: TEC 72010:2023 with latest amendments (Type to be used as per site requirement)
7	Battery	TEC GR Standard No.: TEC 67030:2024 with latest amendments if any
8	Patch Cord	TEC GR Standard No.: TEC 87070:2009, with latest amendments if any.
9	Splice Closure for Optical Fibre Cables	TEC GR Standard No.: TEC 87080:2010 with all amendments if any. Size to be used as per OFC used at site
10	Fibre Termination Box	TEC GR Standard No.: TEC 87030:2010, with latest amendments if any. Fibre Termination BoxSize to be used as per OFC used at site
11	PLB HDPE Duct	TEC GR Standard No.: TEC 72030:~~2019~~ 2025 with latest Amendments if any
12	PLB HDPE Duct Accessories Push fit Coupler	PLB GRTEC/GR/FA/CDS-008/04/AUG-19 with latest amendments if any
13	Installation Accessories and fixtures of Self-Supporting Metal free Optical Fibre Cable	TEC GR Standard No.: TEC 87060:~~2017~~ 2024, with latest amendments if any

S. No.	Type of Material	Technical Specifications
14	FDMS (Indoor)	TEC GR Standard No.: TEC 87010:2007, with Amendment Dated 02.05.2012 and with latest amendments if any (Fibre Termination Box/FDMS Type-IIIA & IIIB – 48F at GP locations) Fibre termination in GP can be accomodated in a rack used for router and other equipment. 01 No. 48 fibre rack mount shelf to be used for fibre termination as per GR 87010:2017.
15	FDMS (Outdoor)	TEC GR Standard No.: TEC 87050:2012, with latest amendments if any The No. of trays in case of 48 Fibre ribbon OFC will be 4.No. of sleeves will be 25% extra than the required joints i.e. 20 Nos.
16	Tension/Suspension Pole Assembly Set	TEC GR Standard No.: TEC 87060:~~2017~~ 2024, with latest amendments if any
17	MPLS Router	TEC/GR 48050:2024 Standard with latest amendments if any or
18	Data Storage Infrastructure	TEC GR Standard No.: TEC 49100:2015, with latest amendments if any
19	Ethernet electrical to optical media converter	TEC GR Standard No.: TEC 48080:2014, with latest amendments if any
20	UPS	TEC GR Standard No.: TEC GR 66160:2024 or TEC 66140:2019 with latest amendments, if any without any Hybrid functionality and including BMS features
21	Radio Modem in ISM band for UBR	TEC GR Standard No.: TEC 38050:2023, with latest amendment, if any
22	EMS for UBR	TEC GR Standard No.: TEC 52006:2016, with latest amendments, if any
23	Fibre Distribution Frames for UBR	TEC/GR/TX/FDF-01/02/May-2010 TEC GR Standard No.: TEC 87000:2010, with latest amendement, if any
24	FTTx based Broadband Access Applications using Gigabit Passive Optical Network (GPON) Technology with Mini-OLT	TEC/GR/FA/PON-002/02/NOV-18 Standard with latest amendments if any
25	Remote Fiber Monitoring System (RFMS)	TEC 88150:2015 with latest amendment.

S. No.	Type of Material	Technical Specifications
26	Network Management System	TEC GR Standard No.: TEC 48100: ~~2015~~ 2025 with latest amendments, if any

Note:

- The technical and functional specifications mentioned in this RFP are mandatory and also supersedes GR for the clauses where there is any change.
- The supply of 48F Armoured ribbon type OFC will be as per GR under preparation.
- All the deliverables for the S-NOC items, mentioned in the tender, shall be as per the relevant TEC GR/ Standard, if not defined otherwise in the RFP/ Amendments. The items which are not mentioned in the tender shall be optional.
- The specifications which are explicitly mentioned in the RFP/ Clarifications/ Amendments shall be mandatory. Remaining compliances, as per relevant TEC GR, shall be optional
- TSEC for Rack (at Block & GP) shall be obtained as per Technical Specifications mentioned in the RFP
- The relevant TEC GR/ Standard is likely to be released before award of contract under the tender. In case the said TEC GR/ Standard is delayed, the data of Table (regarding physical characteristics) will be provided to the successful bidders.

Notes for MTCTE and NSDTS:

a) **MTCTE Certification**: The offered model shall comply with the Mandatory Testing and Certification of Telecom Equipment (MTCTE) requirements of TEC/DoT as mentioned in product specifications mentioned below. Bidders whose offered model has been applied for MTCTE certification as on the bid submission date shall also be eligible to participate in the bidding process. Such bidders must submit documentary evidence of the MTCTE application/status along with their bid. However, the successful bidder shall ensure submission of the valid MTCTE certificate for the offered model prior to supply of the product. No supply shall be accepted without the requisite MTCTE certification.

b) **NSDTS / Trusted Telecom Compliance**: As on the bid submission date, the ~~bidder's company/entity~~ equipment vendors/OEMs shall be registered as a Trusted Source on the Trusted Telecom Portal (TTP) under the National Security Directive on Telecommunication Sector (NSDTS). Documentary proof of such registration shall be submitted along with the bid. Further, the offered make and model of the Switch shall be duly cleared/approved on the Trusted Telecom Portal prior to supply. The successful bidder shall provide documentary evidence of such clearance before delivery of the equipment.

Annexure B: TECHNICAL SPECIFICATIONS OF NETWORK AND ITS COMPONENTS

I. Network

1. General requirements:

a. The network should support successful fibre connectivity to rural areas of the country, connecting to all GPs and Villages and accessible on a non-discriminatory basis to all ~~service Provider~~ PIA to enable them to provide services in rural areas.
b. The network should be built to provide the following:
i. Higher Network Uptime
ii. Complete Centralized Visibility of Network
iii. Segregation of Traffic and QOS in line with Industry standards
iv. Better Network Management (Provisioning, Activation, Fault, Performance etc.)
c. The network should have the capability and facility for seamless integration with all other components required to build a digital backhaul.
d. Network must support next generation architecture to support future technologies like 5G, ~~6G~~ etc.
e. Devices must support the dynamic redundancy protocol for better convergence.
f. Network Convergence methods like Fast reroute and bidirectional failure detection must be deployed to achieve faster convergence.
g. Network must support segregation of traffic using Virtual Routing and Forwarding (VRF).
h. QoS enables a network to provide improved service to selected network traffic. The Network must support IPMPLS QoS features.
i. All Gram Panchayat (GP) nodes should have the capabilities to program the queues into logical queues to offer multiple services to the end customers.
j. The mapping of QoS should be done on the basis of COS, IP prec, TOS, IP address, VLAN etc.
k. All nodes in network must support Hierarchical Quality of Service for granular QoS.
l. Network should have multicast capabilities and should support at all layers.
m. High QoS, Uptime, Security, L3, L2 and Multicast Services from edge where the nodes are connected should be ensured as it will be connecting to MSOs, SP and Telcos.
n. Packet clock, 1588 should be supported for connecting Telco.
o. IP/MPLS NNI with telcos and other Service providers for traffic exchange at all nodes should be supported.
p. Interoperability between OEM for non-vendor locking should be supported at all nodes. Proposed technology partner / OEM for active infra to provide an undertaking to take responsibility of ensuring interoperability with other vendors. Interoperability between OEM should be supported over standard ITU-T, ETSI and IETF defined protocols
q. All nodes in network must support protocol for management information sharing so that devices can discover and reach to each other.

r. Any changes in topology should be automatically learnt by all the devices in network.
s. No manual intervention should be required in case of any physical link failure.
t. Scalable dynamic protocol should be supported for transferring of customer network information across all service edge devices.
u. The network must provide detailed Change monitor or baseline deviations applications, source and destinations. The change monitor dashboard must compare changes in applications, source and destinations in terms of percentage increase/decrease for last 15 mins/ 30 mins/ one hour/ one day against historical time period of 24 hours/ 7 days/ one month etc.
v. OEM must provide performance, throughput and features evidence. GFGNL reserves the right for asking the bidder to do a PoC that validates all technical compliance as submitted in the tender document.
w. The network must support end to end SLA guarantee with features to automate the path based on latency and Jitter.
x. The network must support Zero Touch Provisioning capability & Automated node provisioning.
y. Network Should have integrated capability to monitor link and services.
z. To avoid single point of failure (SPOF) at GP, hardware redundancy shall be ensured in such a way that the failure of one line (WAN) port shall not impact the service on the redundant line (WAN) port at the same time with either interface card level or port level or box level redundancy in GP level router.

2. QoS Architecture

a. Low latency Queuing should be deployed to ensure CIR guarantee to all Critical Traffic
b. Minimum 4 Class-of-Service Model should be supported:
c. Matching of traffic should be based on ACL, IPP, DSCP & MPLS EXP
d. Marking of traffic Should be based on MPLS EXP
e. Should also support weighted random early detection in the network to avoid congestion.

3. **Traffic Engineering Capabilities**

a. Standard based protocols to automatically map packets onto the appropriate traffic flows should be supported.
b. Should Support transport of traffic flows across a network using IP/MPLS forwarding.
c. Should support the determination of routes for traffic flows across a network based on the resources the traffic flow requires and the resources available in the network.
d. Should Employ ", segment routing" in which the path for a traffic flow is the shortest path that meets the resource requirements (constraints) of the traffic flow.
e. Should support QoS on Traffic engineering paths or LSPs.
f. Should support Recovery of link or node failures that change the topology of the backbone by adapting to a new set of constraints.
g. Providing bandwidth guarantee for critical real-time applications in the control plane

h. Optimized utilization of redundant
i. Handling of unanticipated load in the network
j. Fast reroute to provide fast convergence for critical real-time application traffic.

4. Network - MPLS VPN

All Service edge nodes in network should support:

- Layer 2 MPLS VPN
- Layer 3 MPLS VPN: Layer 3 MPLS VPN can be broadly classified into Hub and Spoke VPN, MESH VPN, Extranet VPN, Multicast VPN
- Above specifications are minimum. Any additional feature or futuristic upgradation shall be allowed.

II. Technical Specifications for Routers

Block Routers Minimum Capacity: Type-A = 800 Gbps, Type-B = 300Gbps
GP Routers Minimum Capacity: Type-C = 80 Gbps, Type-D = 40Gbp

S.no.	Parameters	Block Router	GP Router
1	Category of Router	The router/Operating System should be compliant to TEC- GR 48050:2022 dated on March 2022 or its latest amendment as per non-Chassis based Aggregation router Category XV or Chassis based Category VI. The OEM shall need to submit a copy of valid TSEC/ TAC or proof of having applied for TSEC/ TAC (BSNL registered QF-103 or TEC Form-B) at the time of technical bid submission and the final certificate before commencement of shipment Router should be provided with 1+1 or N +1 power supply and Fan redundancy. Power supplies and Fans should be hot swappable for high availability, to ensure that there is no outage till both (main and standby) power supplies/ fans fail.	The router/Operating System should be compliant to TEC- GR 48050:2022 dated on March 2022 or its latest amendment as per non-Chassis based Aggregation router Category XV. The OEM shall need to submit a copy of valid TSEC/ TAC or proof of having applied for TSEC/ TAC (BSNL registered QF-103 or TEC Form-B) at the time of technical bid submission and the final certificate before commencement of shipment. Router should be provided with 1+1 or N +1 power supply and Fan redundancy. Power supplies and Fans should be hot swappable for high availability, to ensure that there is no outage till both (main and standby) power supplies/ fans fail.

S.no.	Parameters	Block Router	GP Router
2	Quantity of each Type of Interface i.e. 100G, 10G, 1G etc	The router can be Chassis based for Type A with Control plane & Data plane redundancy but shall be of non-chassis based 1RU form-factor for Type B. Routers shall be as per requirement of chasis and non chasis router defined in GR 48050:2022 **Block Routers shall be of two configuration:** **(1) Type A(Master Block)-** Router should support switching capacity of minimum 800 Gbps. The router should be enabled on day 1 with the following configuration: **a.** 4 port of 100G (with 40km /80Km pluggable) **b.** 12 port of 10 G (with 40km pluggable) **c.** 4 port of 1G/10G (All ports should be usable for both 1G as well as 10G as per plugged SFP) (2) **Type B (Sub-Block)** Router should support switching capacity of minimum 300 Gbps. The router should be enabled on day 1 with the following configuration: 2 port of 100G (with 40km / 80Km pluggable) 8 port of 10G (with 40km pluggable) 4 port of 1G/10G (All ports should be usable for both 1G as well as 10G as per plugged SFP) **c.** Note: Pluggables will be as per Fiber planning	The router shall be of Non-Chassis based 1RU form-factor, **GP Routers shall be of two configuration:** **(1) Type C-(GP where Childring parented)** Router should support switching capacity of minimum 80 Gbps. The router should be enabled on day 1 with the following configuration: **a.** 4 ports of 10G (with 40km pluggable) **b.** 4 port 1/10G (All ports should be usable for both 1G as well as 10G as per plugged SFP) **c.** ~~4 port electrical 1G ethernet (RJ45 without SFP)~~ 4 port 1G (with 10km Optical or Electrical pluggable/SFP) **(2) Type D (GP to GP Ring)** Router should support switching capacity of minimum 40 Gbps. The router should be enabled on day 1 with the following configuration: a. 2 port of 10G (with 40km pluggable) b. 2 port of 1G/10G (All ports should be usable for both 1G as well as 10G as per plugged SFP) c. ~~4 port 1G electrical RJ45(Without SFP)~~ 4 port 1G (with 10km Optical or Electrical pluggable/SFP) Note: Pluggables will be as per Fiber planning
3	Wavelength, Distance criteria etc of each type of optical interface	The router should support all 100G ports for 100m, 10km, 40km & 80KM pluggable, and 10G ports for 100m, 10km, 40km & 80KM pluggable.	The Router should support 10G with 10km,40km,80km pluggable and 1GE optical port for 100m, 10km pluggable support.

S.no.	Parameters	Block Router	GP Router
4	Requirement of optional Security features	Router shall have support for DHCP snooping feature .All security requirements mandated with flag “Y” in the feature mapping table of the GR for category XV	Router shall have support for DHCP snooping feature. All security requirements mandated with flag “Y” in the feature mapping table of the GR at page-137 for category XV
5	Requirement of eMS	Single eMS of adequate capacity is to be supplied for all routers in the State. eMS will be as per Section above of TEC- GR 48050:2022 dated on March 2022 or its latest version.	Single eMS of adequate capacity is to be supplied for all routers in the State. eMS will be as per Section above of TEC- GR 48050:2022 dated on March 2022 or its latest version.
	6. Requirement of eMS network as per clause 3.33.1		

S.no.	Parameters	Block Router	GP Router
7	Requirement of eMS network redundancy and network elements		
8	Category and Type of Server Required for the eMS	Single eMS of adequate capacity is to be supplied for all routers in the State. eMS will be as per Section above of TEC- GR 48050:2022 dated on March 2022 or its latest version.	Single eMS of adequate capacity is to be supplied for all routers in the State. eMS will be as per Section above of TEC- GR 48050:2022 dated on March 2022 or its latest version.
9	Type of Storage Required for the eMS		
10	Requirement of Optional eMS features		
11	Scalability requirements for the SLA Management system like no.of business customers, maximum leads per customer etc may be provided		
12	North Bound interface required towards NMS		
13	Requirement of Optional Features		

S.no.	Parameters	Block Router	GP Router
14	Clock support	Router should support NTP, Sync E, IEEE 1588v2 PTP (including G8265, G8273, G8275 profiles as applicable) and NTP. It should have internal Stratum 3E clock with holdover time of at least 4 hours.	Router should support NTP, SyncE, IEEE 1588v2 PTP ((including G8265, G8273, G8275 profiles as applicable) and NTP. It should have internal Stratum 3E clock with holdover time of at least 4 hours.
15	Ipv4 / Ipv6 Routes to be supported shall be specified for the aggregation and Core Routers among the options given	The router should have capability of minimum 2 lakh Ipv4 / 1 lakh Ipv6 routes.	The router should have capability of minimum 20k Ipv4 / Ipv6 routes.
16	Documentation requirements as per clause mentioned above	The contractor shall provide following documents: a. System description documents b. Installation, Operation and Maintenance documents c. Training document d. Repair manual All technical documents shall be in English language both in CD- ROM and in hard copy. All necessary interfaces, connectors, connecting cables and accessories required for satisfactory installation and convenient operations shall be supplied. Type of connectors, adapters to be used shall be in conformity with the interfaces defined in this GR. All installation materials, consumables, and spare parts to be supplied.	The contractor shall provide following documents: a. System description documents b. Installation, Operation and Maintenance documents c. Training document d. Repair manual All technical documents shall be in English language both in CD-ROM and in hard copy. All necessary interfaces, connectors, connecting cables and accessories required for satisfactory installation and convenient operations shall be supplied. Type of connectors, adapters to be used shall be in conformity with the interfaces defined in this GR. All installation materials, consumables, and spare parts to be supplied.
17	Additional Installation Requirements as per clause mentioned above		
18	Maintenance Requirements as per clause mentioned above		

S.no.	Parameters	Block Router	GP Router
		All literature and instructions required for installation of the equipment, testing and bringing it to service shall be made available in English language. For the installations to be carried out by the supplier, the time frames shall be furnished by the supplier including the important milestones of the installation process well before commencing the installations. Special tools required for wiring shall be provided along with the equipment. All the software updates shall be provided on continuous basis for a minimum period of 7 years or up to validity of the contract, whichever is later from the date of induction of system in the telecom network. These updates shall include new features and services and other maintenance updates. In the event of a bug found in the software, the manufacturer shall provide patches and firmware replacement if involved, free of cost. Compatibility of the existing hardware shall be maintained with future software/firmware.	All literature and instructions required for installation of the equipment, testing and bringing it to service shall be made available in English language. For the installations to be carried out by the supplier, the time frames shall be furnished by the supplier including the important milestones of the installation process well before commencing the installations. Special tools required for wiring shall be provided along with the equipment. All the software updates shall be provided on continuous basis for a minimum period of 7 years or up to validity of the contract, whichever is later from the date of induction of system in the telecom network. These updates shall include new features and services and other maintenance updates. In the event of a bug found in the software, the manufacturer shall provide patches and firmware replacement if involved, free of cost. Compatibility of the existing hardware shall be maintained with future software/firmware.
19	**Environmental Conditions**- The routers shall be installed in the buildings without air conditioning where adequate ventilation may or may not be available. Therefore, the routers shall meet the Temperature and Humidity Requirements as per Category B of QM-333 standard.		
20	~~**PQC(Post Quantum Cryptography)- Quantum Safe feature support**~~		
21	The Block(Sub-Block/Master-Block)Router could be working with DC input Power Supply. The GP Router could be working with AC input Power Supply.		

~~Note:1~~

~~The category of router and applicability of latest TEC GR is fundamentally in alignment with BSNL central RFP. the bidder/OEM must comply with the category B QM-333 standard or an equivalent international standard.~~

III. Technical Specifications for EMS of Routers

S. No.	Parameter	Specification
1	System Architecture	Distributed, scalable, and modular architecture with centralized management ~~for multi-vendor devices~~. EMS for routers from 3rd party vendors shall not be allowed.
2	Protocol Support	SNMPv1/v2/v3, CORBA(Optional),, XML/JSON, CLI, NETCONF, TL1(Optional), Telnet, SSH, Rest API and HTTPS for network device communication.
3	Fault Management	Real-time detection, correlation, and root cause analysis of faults with alarm classification (Critical, Major, Minor).
4	Configuration Management	Auto-discovery of devices, configuration backup/restore, version control, and support for parameter template validation.
5	Performance Management	Monitoring of key performance indicators (KPIs) such as bandwidth, latency, jitter, throughput, and packet loss.
6	Security Features	Role-based access control (RBAC), multi-factor authentication, audit logs, and secure communication using HTTPS and SSH.
7	Topology Management	Automatic discovery and visualization of logical and physical network topology with dynamic updates.
8	Inventory Management	Comprehensive tracking of hardware and software resources with versioning and lifecycle management. Bidder shall provide NMS. The EMS will be integrated with NMS. The Life cycle management is also part of NMS. However, on standalone basis, the EMS should support the basic architecture and functionality to seamless provide and exchange information with NMS.
9	Notifications and Alerts	Configurable alerts via SMS, email, and push notifications for critical events, with escalation mechanisms. EMS alerts should be capable of integrating with bidder's external SMS and email facilities.
10	Database Support	Compatible with relational databases such as Oracle, PostgreSQL, or MySQL, with high-availability support or equivalence database support
11	Platform Compatibility	Cross-platform support for Linux or and Windows or Unix, compatible with virtualized and cloud-based environments.

S. No.	Parameter	Specification
		The IT and Non IT infrastructure for hosting EMS is the responsibility of PIA except Power and space at data centre. The compute (VM) and storage of S-NOC will be provided by the PIA. The EMS and associated software including OS, RDBMS and other licenses in the name of GFGNL are in the scope of bidder without any additional cost to GFGNL.
12	Reporting	Customizable and pre-defined reports on network performance, fault trends, SLA compliance, and inventory. The EMS should provide an NBI interface to OSS, BSS, and NMS for reporting. Additionally, if the EMS includes a reporting feature, the Bidder/OEM should not restrict GFGNL from generating reports for betterment of service performance
13	Backup and Recovery	Automated backups, ~~disaster recovery~~, and failover support for uninterrupted management.
14	Integration	Open API/REST API support for integration with NMS, OSS/BSS, trouble ticketing systems, and other third-party tools.
15	Time Synchronization	NTP-based synchronization to ensure accurate event and log timestamping.
16	Compliance	Adherence to ITU-T M.3010, M.3020, and TEC standards TEC/SD/IT/EMT-001/01/MAR-2016 and TEC/GR/SW/EMS-001/02/NOV-09. or equivalent STANDARD FOR GENERIC REQUIREMENTS TEC 48050:2024
17	Scalability	Capable of managing network elements as per solution with support for clustered and distributed deployment models.
18	User Interface	Intuitive, web-based GUI with customizable dashboards, and role-specific access. The EMS shall provide an executive dashboard displaying service desk KPIs through graphs and charts. It shall support a flexible, user-customizable interface for detailed or holistic system views and allow a summary view of all dashboards across the enterprise.
19	Maintenance and Support	24x7 technical support, periodic updates, and SLA-based response times.
20	Testing and Certification	Conformance tested for interoperability with multi-vendor devices and certified per TEC GR standards. As per TEC of EMS, The NEs in the network communicate with their respective EMS. The NE–specific EMS is communicated via standard protocol, through the northbound interface to a higher-level NMS that provides integrated multivendor network management.

S. No.	Parameter	Specification
21	Other	Selected bidder will have to supply EMS (Element Management System) for new network solution elements. Further, selected bidder & their OEM partner will have to integrate EMS with GFGNL's existing NMS (Network Management System) through API or any other suitable mechanism as per the requirement of GFGNL's NMS application and up to the satisfaction of GFGNL. The bidder shall propose the Storage as per the solution requirement. VM, RAM, Storage, CPU will be provided by bidder. All EMS server and other software license will be provided by Bidder. The processor loading at rated capacity of the network elements shall not exceed 70% of the total processor capacity. Server shall have dual redundant power supplies. All servers shall be rack mounted using rack mounting kits to be supplied by the server vendor (OEM). — NBI API Standards should be base ○ T-API ONF ○ IETF L3SM & L2SM ○ SNMP — SBI API Standards should be based on ○ Netconf, CORBA, CLI ○ PCEP ○ BGP-LS, LLDP ○ gRPC/gNMI **Centralized GUI Based SDN Controller** Requires for End-to-End management of Network supporting Full FCAPS Functionality with additional features like Zero Touch Provisioning, Templates based service creation, representation of 3rd part NEs as Un-managed Elements and present various network audit and reporting features (Dash boards, PDF Reports etc).

Note:

It is the bidder's responsibility to do the proper due delegation while selection of OEM/s related to this ask of seamless traffic flow in between diverse set of components. Interoperability and openness are the critical expectations. The opaque, restrictive integrations aspects limiting interoperability within BharatNet framework is not acceptable.

~~IV. Server Hardware Specification~~

~~S.No~~	~~Server Hardware Specifications~~
~~1~~	~~The Server proposed shall conform to TEC Standard No.: TEC 48140:2018 or latest amendment if any *(old document No.- TEC/GR/IT/SRV-001/02/MAR-18)*.~~
~~2~~	~~All the servers shall be DC/AC powered for Data centres.~~
~~3~~	~~The processor loading at rated capacity of the network elements shall not exceed 70% of the total processor capacity~~
~~4~~	~~Server shall be 64-bit RISC / EPIC / CISC architecture processors with minimum 8 cores in each server.~~
~~5~~	~~The server should be provided with a minimum of 2 numbers of hot plug 600GB10K RPM SAS hard disk drives~~
~~6~~	~~No of equipped cores shall be as per sizing given by the software (Application) OEM.~~
~~7~~	~~Server shall have dual redundant power supplies.~~
~~8~~	~~All servers shall be rack mounted using rack mounting kits to be supplied by the server vendor (OEM).~~

V. Technical Specifications for OFC

#	Parameters	Optical Fibre Cable -Minimum Specifications
1.	Fibre count	Armoured cable of 24 F or more & for ADSS with G.652D will be accepted and shall support for both aerial and underground cable as per TEC.
		Under Ground : 48F/96F and more (Armored Optical Fibre Cable(Type: Ribbon) for underground application) 24F Armored Optical Fibre Cable Loose Tube
		Aerial : 24F ADSS unarmored cable
2.	Standard	**Under Ground**: ITU-T-G.652D (TEC GR Standard No.: TEC 85260:2024 with latest amendment.) or with latest amendment if any TEC GR Standard No.: TEC 85170:2024 with latest amendments Although in this TEC/ GR only optical fibre of G.652 D is mentioned but vendor shall have liberty to use G.657A1 also as per ITUT recommendation for better offered product portfolio .
		Aerial: TEC 85200:2022 (Aerial Drop) (Loose tube with jelly compound & Water swellable tape / yarn) with latest amendment **Aerial cable on Powerline:** TEC 85190:2022 (Type-A-I semi dry Without Ice loading) with latest amendment

#	Parameters	Optical Fibre Cable -Minimum Specifications
		Similarly, 24F LT Armoured cable and 24F ADSS cable will be with G.652D. The vendor shall have liberty to use G.657A1 also as per ITUT recommendation for better offered product portfolio .
3.	Jacket Material	HDPE
4.	Strength member	FRP
5.	Application	Cable must be suitable for outdoor as well as indoor applications.
6.		Cable must be suitable for machine blowing as well as manual pulling in duct in case of UG application.
7.		Cable must be suitable for UG as well as aerial installation.
8.	Cable/Making Indicator On Both Aerial & UG Cable	"GFGNL OFC" should be engraved on it.

VI. Technical Specifications for Mini-OLT

S. No.	Parameters	Minimum Specifications for Mini-OLT
1	Compliance	TEC/GR/FA/PON-002/02/NOV-18 Standard with latest amendments if any or
2	Technology	Layer 2 GPON
3	Certification	MTCTE, NCCS
4	Uplink Port	2*10/100/1000M and 1*10G
5	GPON/EPON Port	4 GPON
6	Physical Interface	SFP Slots
7	Max Splitting Ratio	1:128
8	Attributes of the PON Interface	Class B+ and Class C+/C++ GPON module
9	Standards	ITU-T G.984/G.988
10	Layer 2 Protocol	Should support Spanning Tree,IEEE 802.1Q, VLAN,IEEE 802.1w, RSTP,IEEE 802.3ad physical link static/dynamic aggregation,Support OMCI Encryption enabled / disabled for ONT,Support OMCI authentication for ONT,(LACP),QoS,Multicast, Reliability, DHCP, ERPS or equivalent standards

S. No.	Parameters	Minimum Specifications for Mini-OLT
11	Network Security	Limiting the maximum number of users on each port,Port isolation, Packet storm control,Flow-based ACL access control function Transmission data encryption on the,PON interface, Supports TACAS+ /RADIUS
12	Configuration Management	Various management modes such as CLI, SNMP and TELNET, Conducting software upgrade through TFTP Debug output, NETCONF/YANG, REST API or equivalence. OLT shall also provide EMS GUI access through standard web Browser like IE, Firefox, Google Chrome.
13	Backplane Bandwidth (Gbps)	40 Gbps
14	Power Supply	AC 110V to 280V,
15	Operating Environment	~~0°C-60°C;~~ The OLT shall comply with Category B2 QM-333 environmental standards
16	Max ONU Support	128
17	Services	Triple-Play, VPN, IP Camera, Enterprise LAN and ICT applications
19	Transmission Distance	Up to 20 Km
20	Data rate	Downstream: 2.5 Gbps, Upstream: 1.25 Gbps
21	Power Consumption	Up to 50W
22	Interoperability	Can support at least two or more different OEM for ONT and OLT
23	Features	The Mini-OLT shall be designed to have protection of power transient, power-surge and power blowouts. The equipment shall be adequately protected in case of voltage variation beyond the range as specified above and also against input inverse polarity.
24	Interoperability	- OLT shall also interoperable with all existing ONTs being used in BSNL BharatNet Phase- I and BharatNet Phase -II and any future ONTs to be used, by loading of suitable patches without any additional cost. It will be preferred if the loading of Patches is done through EMS/ NMS without visiting site.
25	Other	- Static and dynamic IP allocation should be supported - DBA(Dynamic Bandwidth Allocation), Multicast,QoS,SNMPv2C/V3 support

Note:

It is the bidder's responsibility to provide any electronic products with necessary software to meet the RFP expectations ~~in "4S- section"~~. Here, in this case it may be "EMS" and that is implied with TEC GR# TEC-GR-PON-002-02-Nov-18. The bidder may do the proper due diligence while selecting OEM.

Bidder has to supply Mini-OLT with fully loaded uplink. However, pluggable for GPON module is to be considered for 2 ports.

In case in future, if any demand of additional SFP then bidder has to provide at Rs. 5,000/- per SFP

VII. Technical Specifications For ONT(Optical Network Terminal) manageable

Sr. No.	Parameters	Minimum Specifications
1.	Optical port	ITU-T G.984/G.988,with 2.488 Gbps Downstream and 1.244 Gbps Upstream , SMF single port interface, 28dB (Class B+)
2.	Ethernet port	10/100/1000 Mbps -4 port and 1* PON (SC/APC)
3.	Distance support	Upto 20Km (depending on Splitting Ratio)
4.	Operating temperature	0 to 50 ˚C
5.	Others	Dual band Wi-Fi 6 supports ONT, Type 1. Home-ONT (H-ONT) for FTTH applications. 64 MAC addresses, 16 VLAN
6.		Should work in non-AC environment
7.		Support SNMP V3, Remote management, OMCI, TR69 should have facility to set password for local & remote login, ITU-T G.984.1/2/3/4, 32 Tcont,128 Gemport, Support FEC (Forward Error Correction) downstream and upstream, support SBA/DBA
8.	LEDs	Should show status of link, full / half duplex, speed, and power on
9.	Manageability	MQTT/Modbus TCP/IP, Simple Network Management Protocol (SNMP), support SSH, SNMPv3, Telnet, and HTTPS, support WEB /TR069/TELNET/CLI, support DHCP functions like DHCP Server and DHCP Relay
10.	Power	Should be supplied with power adapter so that it can work on 230 V AC power, compatible with all India Power Standards.
11.	GPON equipment	As TEC-GR-FA-PON-002-02-NOV-18 /TEC 72050:2021or latest with all amendments
12.	Safety standard	UL/IEC/ MTCTE and NSDTS certified

VIII. Technical Specifications for FDMS

FDMS	
Parameter	**Specification**
FDMS (Indoor) TEC	TEC GR Standard No.: TEC 87010:2007, with Amendment Dated 02.05.2012 and with latest amendments if any. Fibre termination in GP can be accommodated in a rack used for router and other equipment. 01 No. 48 fibre rack mount shelf to be used for fibre termination as per GR 87010:2017.
FDMS (Outdoor) TEC	TEC GR Standard No.: TEC 87050:2012, with latest amendments if any The No. of trays in case of 48 Fibre ribbon OFC will be 4 No. of sleeves will be 25% extra than the required joints i.e. 20 Nos.
Type	Rack Mount
Space	48 fibres per 3U
Connector Type	LC-PC/SC-APC
Material	Steel / aluminium powder coated
Compliance	Free of halogen, Fully compliant with 2011/65/EC (RoHS)
Ports position	Front side only

IX. Technical Specifications for CPE (customer premise equipment) L2 manageable switch – 24 ports

Sr. No.	Parameters	Minimum Specifications
1.	Switch Performance & Throughput	The Switch should support a minimum of 50 Gbps Switching Fabric Capacity. • The switch should have forwarding rate of min 40 Mpps
2.	No. of Ports	24 ports of 10/100/1000 BaseT (out of 24 ports, 12 ports should be PoE supported with PoE power support of minimum 80W) and 2 Uplink ports of 1GE (10/100/1000Mbps) with RJ45 without SFP ~~and~~ Or with sperate optical SFP
3.	MAC	Support for minimum 8K MAC entries
4.	Features	DHCP, IGMP V3, IEEE 802.1Q VLAN encapsulation, 802.1d (Spanning tree), 802.1w (RSTP), 802.1s (MSTP) Should support minimum 250 active VLANs.
5.	Security	• IEEE 802.1x, RADIUS. • Telnet, Secure Shell (SSH) Protocol, and Simple Network Management Protocol Version 3 (SNMPv3).
6.	Operation Temperature	0 to 50 ˚C
7.	Power input	230 V AC, 50-60 Hz
8.	Safety standard	UL / IEC / MTCTE and NSDTS* certified

X. Remote Fibre Management System (RFMS)

Parameter	Specifications
Ports	48
Space in Rack	Maximum 2 U
Connector Type	LC/SC (Front position preferable)
Power input	Dual DC~~/AC (As per site availability)~~
Wavelength Supported	1650 nm or 1625 nm ~~, 1550 nm / 1310 nm~~
Dynamic Range	40 dB or higher
Event dead zone	<= 1 m
Attenuation dead zone	<= 4 m
Optical Distance Accuracy	± (0.75 + 0.0025% x distance + sampling resolution)
Optical Test Cycle	Min 40 Million cycles
Pulse Width	6 ns to 20 us
Power Consumption	10W
Certifications	CE, CSA-UL (Optional), RoHS
EMS H/W	Server/Storage/Firewall
EMS S/W	Application/ License
MISC	Parent-Child /Otau type solution is not allowed
	The system should have high availability feature with automatic switchover from active server to backup server in case of failure.
	System should be able to create users and manage passwords from centralized tool
	The Administrator will be placed at NOC and manage the system. The solution should support upto 50 numbers of concurrent users having view/edit rights It should be possible for the system administrator of fiber monitoring system to see all the connected users with their IP address in a single window. All the user's activity should be stored in the database and can be displayed with the audit log function. EMS should be able to integrate with other third-party NMS via Rest API or SNMP

Parameter	Specifications
	The RFTS system will be able to provide alarm, alert notification, and automatic generation of customized reports to provide timely and valuable information on the fiber network health, availability, and provide historical trends of these performance indicators. This capability would be extended to Operation In-charge of each RTU location via web browser (Google chrome etc.) on mobile/tablet/laptop or any device which supports web browser (Google chrome etc.). The RFTS system must have a mobile application operating on android and iOS for remote P2P tests.
	Software upgrades from the Server and client should be done remotely. Software upgrades on Remote Test Units shall be done from the server which will contact every RTU automatically for up-gradation. This can be done in bulk and at a specific time.
	For each monitored fiber, it should be possible to obtain fiber performance versus time. This graph should show the evolution of the fiber optic budget. The graph can be displayed for the last hour, day, week, month or year. By viewing the evolution of the fiber budget, user should immediately know whether this alarm is caused by a long term or short term effect.
	The system shall have a provision to tag .KMZ/.KML files to be associated to the relevant routes/ports to derive the co-ordinates of the fault or Google map link which can open in google map app which can be installed on PC/Tablet/Mobile phone.
	GFGNL's GIS server for the entire fiber network is in-service. The RFTS system shall be linked with GIS system. All faults should be displayed on the screen of GIS. RFTS system should be able to take the GIS coordinate provided by third party GIS and incorporate in the email alert and SMS alert. The RFTS EMS vendor shall help the GIS vendor to get the RFTS EMS system integrated with the GIS system via REST API or SNMP.
	Bidder is liable to integrate RFMS with GIS

Note: The equipment- RFMS and RFTS mentioned anywhere in the RFP may be referred interchangeably.

a. EMS Server (1+1) and RTU's (Remote Test Units).

b. The remote test unit should have 48 ports within 2U with 10W power consumption. Connectors to be LC or SC type. Connectors should be in the front panel of RTU preferably. RTU should have Dual DC power input capability/provisioning. Each Nodes, about 50%

ports shall be having live or active fiber monitoring facility at 24 Ports (out of 48 Ports) and 24 Ports for dark fiber monitoring. All types of telecom traffic to be considered in case of Live Fiber monitoring. The RFP specifies the functional requirement for live fiber monitoring as well as Dark fibre monitoring at GP level/Other locations. It is the bidder's responsibility to provide all hardware, accessories, interfaces, and associated components required to achieve the specified functionality, including but not limited to bypass/FWDM/STOP PASS filters or equivalent solutions based on evaluation of existing RFMS inventory (i.e should be compatible with existing inventory) and new locations with specified details in RFP, without any additional cost to GFGNL.

c. The OTDR module is required of 1650 nm or 1625 nm, ~~1550 nm / 1310 nm~~ (used for dark and live monitoring both) and dynamic range should be 40 dB or higher. Pulse width selectable between 6ns and 20µs and better. Event dead zone: = <1 Meter. Attenuation dead zone: 4 Meters; Optical distance accuracy: ±(0.75 + 0.0025% x distance + sampling resolution).

d. The system should have high availability feature with automatic switchover from active server to backup server in case of failure.

e. System should be able to create users and manage passwords from centralized tool. It must allow to create user login, password, email and phone from the organizations directory using Lightweight Directory Access Protocol.

f. The Administrator will be placed at S-NOC/SDC and manage the system. The solution should support upto 50 numbers of concurrent users having view/edit rights It should be possible for the system administrator of fiber monitoring system to see all the connected users with their IP address in a single window. All the user's activity should be stored in the database and can be displayed with the audit log function. EMS should be able to integrate with other third-party NMS via Rest API or SNMP.

g. It should be possible that the fiber is still being monitored after a fault is detected. Users are automatically notified if the fault severity or the fault location changes. The user must be notified in case of second fiber cable cut or degradation happens along the cable route before the first cut or degradation is repaired when second cut or degradation is at a shorter distance than the first cut distance. All the changes of event above configured thresholds should be available in alarm history.

h. The RFTS system will be able to provide alarm, alert notification, and automatic generation of customized reports to provide timely and valuable information on the fiber network health, availability, and provide historical trends of these performance indicators. This capability would be extended to Operation In-charge of each RTU location via web browser (Google chrome etc.) on mobile/tablet/laptop or any device which supports web browser (Google chrome etc.). The RFTS system must have a mobile application operating on android and iOS for remote P2P tests.

i. Software upgrades from the Server and client should be done remotely. Software upgrades on Remote Test Units shall be done from the server which will contact every RTU automatically for up-gradation. This can be done in bulk and at a specific time.

j. For each monitored fiber, it should be possible to obtain fiber performance versus time. This graph should show the evolution of the fiber optic budget. The graph can be displayed for the last hour, day, week, month or year. By viewing the evolution of the fiber budget user should immediately know whether this alarm is caused by a long term or short term effect.

a. The system shall have a provision to tag .KMZ/.KML files to be associated to the relevant routes/ports to derive the co-ordinates of the fault or Google map link which can open in google map app which can be installed on PC/Tablet/Mobile phone.

b. GFGNL's GIS server for the entire fiber network is in-service for BharatNet Phase-II. The RFTS system shall be linked with GIS system. All faults should be displayed on the screen of GIS. RFTS system should be able to take the GIS coordinate provided by third party GIS and incorporate in the email alert and SMS alert. The RFTS EMS vendor shall help the GIS vendor to get the RFTS EMS system integrated with the GIS system via REST API or SNMP.

~~c. Integrated cable Management System for Inside and outside plant. Optical Inventory Module for logical and Physical network for port-to-port connectivity, Route search and service provisioning.~~

d. The RFMS consist of eMS 1 Set and RTU as per BoM with all accessories as below

1. eMS -1 Set consists of :-

1.1 eMS H/W (Server/storage/firewall) with 1+0 at DC and 1+0 at DR

1.2 eMS S/W (Application/ License)

2. RTU -1 set Consists of :-

2.1 RTU with 48 port,1650nm or 1625 nm, ~~1550 nm / 1310 nm~~ wavelength,=>40dB. 1 no

2.2 Optical WDM Coupler, 24 nos

2.3 Stop Pass Filter, 24 nos

e. The offered solution/Make-Model should have been successfully in operation for minimum 40% of required quantities for the State, for at least one year in the TSPs' network anywhere or in BharatNet in India. A certificate from the end user should be enclosed with the Bid.

f. GFGNL may use RFMS deployed by PIA to monitor north bound OFC connectivity, used for backhaul/ management for BharatNet connectivity.

g. Bidder is liable to integrate RFMS with GIS

Note-1:

Phase-I and new sub-block locations:

New RFMS with 40 dB dynamic range and 48 ports are to deployed for monitoring of Phase-I GP as per technical specifications mentioned in the bid.

Phase-II GPs:

It is the bidder's responsibility to monitor Ph-II GPs through existing RFMS till September, 2027. Since notional capex is indicated in the computation of O&M of the existing RFMS also and hence It is the responsibility of bidder to provide AMC and O&M till the bidder is availing charges for the same. The GFGNL will enforce the past MAF given by the existing OEM (through past PIA) for as part of contractual obligations entered by the existing OEM and past PIA. In case of any glitches or problems in transition of paid AMC, then GFGNL with administrative responsibility will facilitate the new PIA at risk and cost of past PIA and past OEM. Since, It is the responsibility of bidder to provide new RFMS with remaining years of AMC, warranty and O&M without any additional cost to the GFGNL till the end of the contract duration therefore in the event of any default situation during the transition then new PIA need to preponed the delivery, installation and commissioning in the beginning of the contract.

Note-2:

The IT and Non IT infrastructure for hosting EMS is the responsibility of GFGNL. The compute (VM) and storage of S-NOC will be provided by the GFGNL. The EMS and associated software including OS, RDBMS and other licences in the name of GFGNL are in the scope of bidder without any additional cost to GFGNL.

XI. Minimum Technical specifications for Uninterrupted Power Supply (UPS) System at GP

#	Functional Req.	Parameter
1	Type	Online for TEC GR 66160:2024 ~~or GR 66140:2019~~ or latest updates without any Hybrid functionality. OTA feature requied
2	Technology	Dual Rectifier with double conversion and Dual rectifier with a single inverter architecture including inbuilt stabilizer with range 110V – 280V and mechanism to provide protected environment to switchover on row power supply in case of failure of UPS
3	Backup time	Minimum 6 Hrs with Full load
4	Load	500 Watt
5	Capacity	Minimum 1 KVA
6	Input Voltage Range	110-280 V
7	Output Voltage	AC: 230 V
8	Electrical Safety	*Isolation transformer for Source isolation
9	IP standard	~~IP 21 & above,~~ IP standard - IP 21 & above for Standalone UPS, and IP standard - IP 20 & above for rack mounted UPS. Bidder and OEM to decide the model of UPS as per GP site condition.
10	Creast Factor	3:1
11	Temperature range limitation	Max. Up to 55
12	Input Frequency	50 HZ (+/- 6% at Mains mode) 50 HZ (+/- 1% at Battery mode)

#	Functional Req.	Parameter
14	Output Frequency	50Hz +/- 1Hz
15	Input Power Factor	Greater Than 0.9
16	Waveform	Pure Sine wave
17	Alarm	On battery,Low Bttery, UPS verload,Temprature
18	Alarm Execution method	RJ45 With SNMP at SNOC / CNOC
19	NA	NA
20	Overload Protection	Required
21	Certification	BIS,ROHS, NABL or UL, CE, ISO or equivalent
22	UPS Auto Start on Deep Discharge	Required including "Auto-Shutdown" which turn offs the UPS when the battery reaches specific percentage eg. 10%, this will avoid deep discharge altogether and ensure the longer life of lithium batteries.
23	UPS body	Metal with one unibody design includes UPS and Battery Back with grouted on floor with anti-theft mechanism
24	Battery Technology	Lithium Ion as per TEC GR No.67030:2024 with Li-ion battery BMS to monitor the parameters and alarms and control the charging current of battery with all latest features excluding solar system
25	Battery type	As per load
26	No.of Batteries	As per load
27	Battery Replacement cycle	Min. 6 Hrs Backup must be required for 7 years from the date of go-live, if performance reduce within 7 years, then battery need to be replace without any additional cost to GFGNL.
28	Recharge time	6 to 8 Hrs in
29	Battery warranty	7 Years
30	Wiring	Avg. 15 Mtr wiring with end to end Commissioning at both Input and Output End

#	Functional Req.	Parameter
31	Anti theft Mechanism	Anti theft screw and cabinet/rack etc Anti-theft mechanism for designed model including battery bank Anti theft mechanism is required for standalone UPS+Battery bank installation in case other than rack mounted UPS+Battery bank.
32	Visibility	The PIA shall make suitable provision in the UPS to connect the same with the network elements for extending the UPS related alarms, lie but not limited to, battery, to the SNOC and CNOC Bidder for UPS has to ensure the SNMP or suitable mechanism for all active field network element centrally visible for easy doing business. Failure to this will hold the payment of respective milestones.
33	Output Connector	Minimum 2 nos. IEC Socket

***** Isolation Transformation, Preferablly at source, The end objective is to safeguard networking equipment, the safest practice is to isolate all upstream sources (AC input, bypass source, UPS output, and battery source as applicable) rather than relying on the UPS operating mode alone. bidder is advised to follows standard electrical safety and LOTO(Lockout/Tagout) principles and prevents back-feed or unexpected energization.

Note:1

For Battery Warranty:

Minimum 6 Hrs Backup must be required for 7 years from the date of go-live, if performance degradation start happening below 6 hours as specified in the RFP within 7 years, then battery need to be replaced by PIA / OEM immediately to avoid power outage SLA / penalties, without any additional cost to GFGNL.

Therefore, it is utmost important for the PIA to provide right battery having longer battery hours and tenure i.e. to meet minimum 6 hours in 7 years. The tolerance factor of degradation is 1 hour. Any excess degradation or shortfall in tenure is

the bidder's risk and bidder has to replace the battery free of cost to GFGNL within 15 days. In any circumstances, GFGNL will not bear battery replacement cost if battery performance degrades (after adjusting tolerance) before 7 years.

After 7 years, GFGNL will provide one time cost of Rs. 30,000/- per location only on those cases where battery lasted 7 years in continuity post submission of proof of replacement of battery of the similar or higher specification prevailing at that time with renewal of battery life certificate of 7 years.

Note:2

To avoid repetitive faults and ensure higher network uptime at the Gram Panchayat (GP) level, the Bidder shall not utilize internal wiring/power sockets of Gram Panchayats for input power tapping of UPS. Instead, the Bidder shall arrange power tapping from the Fuse/MCB near the electricity meter of GPs.

Note:3

For monitoring major parameters including Input & Output Voltages, Inside ~~&~~ ~~Outside~~ Temperature, Alarms, % battery back up time left. The monitoring should be possible from SNOC/ Central NOC in real time. Delay in any alarm incident will invite the penalty. For example, for any instance on delay in alarm will be penalized with 0.2% of quarterly O&M billing amount and this will be over and above the maximum O&M cap limit of the O&M billing amount.

The end objective is to monitor all performance parameters of network elements including power utility installed in the network through NMS at SNOC /CNOC. For Better Operation and Managment ,it will be preferrable to support through centrally/ locally based on technical and network feasibility.

XII. Unlicensed Band Radio (UBR)

Parameter	Specifications
Operating Frequency Band	5.X GHz band
Polarization	Should Support Dual polarized
Distance Support	P2P up to 10Km (for 1 Gbps throughput) P2P up to 20Km (for 500 Mbps throughput)

Parameter	Specifications
TEC GR	TEC/GR/R/ISM-MOD-001/04. MAR 2016
Throughput Support	Radio should provide (1Gbps / 500 Mbps as mentioned above) throughput with appropriate backplane capacity with supported distance and geographical environmental conditions
Ports	1 x 100/1000 Base-T[X] type with auto negotiation or 1 GE optical ports (1310nm, all with auto-negotiation, 5 Km range SFPs) shall be provided for FO
Latency	=< 3ms
VLAN Support	Comprehensive VLAN support: 802.1Q, Q-in-Q, Access, Trunk/ Transparent, Quality of Service (QoS)
Security	-WPA-PSK, AES 256 /128-bit encryption ; IPv4 and IPv6 supported. -Security is utmost important, and it should be privately held information for unauthorized access. Hence, it should not be broadcasted. -It should be protected in all case scenario for securing the link from third party including password at wireless link level.
Electrical Requirement	Power over Ethernet (PoE)
Management	GUI-based system with SNMPv3, jumbo frame (9000 bytes) support, dynamic optimization, and advanced interference mitigation
	Automatic channel selection and dynamic auto-optimization
Compliance	WPC, NSDTS, and MTCTE certified The bidder/OEM shall comply with submission of an undertaking or proof of application for the relevant certification as per the RFP, It shall be acceptable at the bidding stage. The successful bidder shall obtain and submit the mandatory certification/approval before commencement of supplies, in accordance with the applicable provisions of the RFP.
	TEC GR Standard No.: TEC 38050:2023, with latest amendment, if any
Environment Requirements	Operating temperature: -10°C to +60°C, above IP65 rated, wind survivability ~~up to 150 km/h~~ minimum 150 Kmph

Parameter	Specifications
	in normal area and minimum 180 Kmph in coastal and Kutch area
Protection	DC surge immunity as per IEC 61000-4-5, Level 2
Monitoring & Reporting	Detailed Ethernet and wireless interface monitoring via NMS
	Real-time counters for Tx/Rx data rates, packet loss, and performance data,Equipment- coldStart, warmStart, linkDown, linkUp, authenticationFailure, and link utilization, performance, latency,etc.EMS/NMS ,Syslog Support atleast : fault, configuration, accounting, performance and security
Advanced Features	GPS synchronization, MAC-level authentication/RADIUS, device alerts, wall/pole mounting, MIMO technology, 1024QAM modulation
Product Lifecycle	Entire Contract duration with extended warranty and end-of-life management , Comprehensive warranty and AMC support for integration and system maintenance till the contract period
Antenna	Dual polarization ensures system operation even if one fails
System Architecture	Full Outdoor (FO) system
System Configuration	Configurable via local terminal using Ethernet
	Browser-based GUI for performance monitoring
Integration & Compatibility	Compatible with GFGNL's nationwide EMS/NMS
	Supports SNMP v3
	Dual-stack support for IPv4 and IPv6 addressing
Radio Features	QPSK to minimum 1024 QAM for spectral efficiency
	Automatic Transmit Power Control (ATPC)
	Dynamic channel and data rate selection
	GPS-based synchronization
Link Planning Tool	Free tool for generating reports (link budget and path profiles) based on GIS MAP data
Upgrade & Maintenance	New firmware download in radio should not affect traffic except the reboot time
	Field upgrades and bulk firmware updates
EMS System	Full integration with NMS
	Internal and external alarms
	Traffic/statistical reporting
Installation & Spares	Includes installation materials, spares, and consumables

Parameter	Specifications
	Grounding cables, fixers, weatherproofing materials included
Performance & Reliability	System availability target: 99.9% annually
	High fault tolerance and reliability for all network elements
Other	All type of data and voice services, wireless back-haul traffic for 2G, 3G,4G and 5G services, FTTx, layer2 VPN, layer3 VPN, point 2 Multipoint VPN and VPLS, IPTV and multicast VPN, Cable TV transmission services along with other bandwidth leasing services supported any to any, one to many, many to many kind of services. The network created should have capability to establish end to end integration as per requirement up to State-Wide Area Network (SWAN) and National Knowledge Network (NKN), Product Supporting for latest technology provisioning.

XIII. Free Space Optics (FSO) / Light fidelity (Li-Fi)

Sr. No.	Parameters	Minimum Specifications
1	Operating Optical Wavelength	785 - 1550nm
2	Distance support	For 10Gbps : Upto 5Km For 1Gbps : Upto 10Km
3	Throughput support	Should support Minimum 1 Gbps per link and support upto 10Gbps per link
4	Ports	For 10G : 1 X 100/1000-BASE-T Ethernet (RJ45) for Configuration/Manangement Fiber interfaces with SC multi or single mode options Interface with 10G SFP+ For 1G : 1 X 100/1000-BASE-T Ethernet (RJ45) for Configuration/Manangement Fiber interfaces with SC multi or single mode options Interface with 1G SFP
5	Electrical requirement	AC 100 – 240 V, 50 – 60 Hz and DC 48 ± 12 V
6	Management	System must provide alarm and control capabilities via Simple Network Management Protocol (SNMP) traps/ MIB File / IP-Firmware, IP monitoring or equivalent standards, Spatial stabilization system (auto tracking), Full duplex
7	Environment requirements	Operating Temperature support: -20 degrees C to +60 degrees C (in installed condition)
8		Working Humidity support: between 10% - 95%, non-condensing at all operating temperatures

Sr. No.	Parameters	Minimum Specifications
9		It should be IP65 and above , Wind survivability for ~~minimum 150 Kmph~~ minimum 150 Kmph in normal area and minimum 180 Kmph in coastal and Kutch area
10		System should be suitable to withstand continuous exposure to rain and sunlight.
11	Safety Classification	Laser safety IEC 60825, Class 1M
12	Latency	<7 ms
13	Compliances	IEEE 802.15.7 ITU-T G.653.b,G.654.b
14	MTU	Jubmo frame upto 9600 bytes

XIV. Rack at GP Locations

#	Parameters	Specifications
1	Size	Minimum 24U Floor Mount
2	Dimensions	Height=24U standard (approx. 1100-1200 mm excluding ~~2000- 2050 mm~~ external height) Width=600 mm - 800 mm ~~depending on cable volume~~ Depth= 800mm- 1000mm~~-1200- mm~~ (choose based on ~~server/storage~~ Equipment depth hosted in GP Rack)
3	PDU	10 no. of 5/15A sockets (with both Amp type supported in two different socket) This can be deliver inbuilt PDU or extended. Sockets requirements are for output end to serve the equipment to be hosted in the rack. Bidder has to ensure for UPS input power to the rack
4	Sliding Trays	2 Nos.
5	IP rating	IP 55 and above
6	Misc.	Front Door Steel Full Proof with lock Lock shall be Manually operated with Key
7		Should have ~~sufficient perforation for ventilation of air with~~ necessary Fan module at top for
8		To be provided with cable manager & patch panel
9		~~Minimum 600 mm above from Floor level. Required fabrication stand to be made by PIA.~~ Scope of patch panel is for the routing of patchcords and cables. Rack should be minimum 200 mm above the ground level. The Bidder may provide fabricated stand or inbuilt base stand.
10		As per site requirement with provision for minimum 20% additional space for future expansion.
11		All enclosure panels are single walled boltable from inside with earthing to be done on all flat parts

#	Parameters	Specifications
12		Front single door with 4-point locking system and in single walled construction with door stay,
13		The housing should be equipped with DC/AC operated cooling Axial Fans, self-starting, double ball-bearing, temperature-controlled operation via controller. Noise level maximum 65dB.
14	Cooling	The cooling fans should be on a fan tray for ease of access and easy fault identification and diagnosis. N+1 Configuration fans Standby fan operates automatically when inside temperature exceeds 60°C OR any of the fans fails. Or to maintain the sustainability of the equipment inhoused in the Rack for better service operation and network SLA
15	Certificate	ISO 9001, 14001, ISO45001 and IS 13252/BIS IP55: IS/IEC 60529: 2001.
16	Frame Material	Zinc magnesium coating or GI material with duly powder coated with UB resistant pure polyester with 25mm system punching (Preffred) in the roof and base frame plus vertical sections with two mounting levels, rolled out of a single sheet. Powder coated with UV Resistant pure polyester RAL 7035 Matt super durable with painting thickness of 80 to 120 microns minimum. **Note:** For, Zinc magnesium coating or GI material with duly powder coated with UB resistant pure polyester, the Objective is to purchase quality rack which should not detoriate over a period of time minimum 10 years. It is the PIA's responsibility to provide quality and robust product line. Any deficiency during the contract period in case be observered at any given of time, then bidder has to replace the same without any additional cost to GFGNL
17	Enclosure Flat Parts Material:	Enclosure Flat parts material: Galvanized sheet steel 1.5mm / 2 mm thick of 120 GSM / Front single door with 4-point locking system and rear panel boltable from inside in single walled construction with door stay, Side panels left and right in single walled construction boltable from inside, Rain canopy of 75mm height with projection all around, with 300 mm base plinth of 3mm thick, The enclosure Flat parts to be gasketed with Outdoor Polyurethane foam gasket, the fasteners will be of SS 304 grade suitable for outdoor application. **Note:** Principle requirement is to secure the devices inside the rack with lock and without damaging from the external factors.

#	Parameters	Specifications
18	TSEC	TSEC for Rack (at Block & GP) shall be applied at the time of bid submission and obtained before the supply as per Technical Specifications mentioned in the RFP

Note:

- For any copper cable termination weather, it is in PDU OR MCB or any kind of equipment termination the end notch of cable should be fitted with safety lugs to prevent further any kind of threat or short circuit.
- Rack dimensions are clearly mentioned in the RFP. However, Bidder has to decide the model of UPS, UPS and battery placement and UPS specification in close co-ordination with respecitive OEM as per GP/Sub-block site conditions.

Rack at Sub- Block/ Shelter locations for Phase 1 & 2 both		
1	Size	42U Floor Mount, Standard ETSI
2	Quantity	2 nos = 1 for Equipment's & 1 for FDMS (Depending on site requirement)
3	Dimensions (Approx.)	2100 mm (H) X 750 mm (W) X 1050 mm (D) (choose based on Equipment depth hosted in Rack)
4	PDU/MCB	Should have min two nos. 32 Amp PDU(16Amp(6) , 32 Amp(2), 6 Amp (2)), each having min six nos. C13 sockets and six nos. 3-pin round socket
5	Sliding Trays	1 Nos.
6	IP rating	~~IP20 –~~IP55: IS/IEC 60529: 2001 ~~&~~ or above
7	Other Specs	Front Door Steel Full Proof with lock and key
		Should have sufficient perforation for ventilation of air with necessary Fan module at top
		To be provided with cable manager & patch panel
		Castor with ft break (2+2)
		Should be openable by removing screws from Left & Right side (Door in front side)
		The Rack should conform to DIN 41494. All products/OEM should be certified according to ISO 9001, 14001, ISO45001 and IS 13252: PART 1 (2010) & IEC, 60950-1 Protection category: IP55: IS/IEC 60529: 2001. Certificate from NABL accredited lab shall be attached
		TSEC for Rack (at Block & GP) shall be applied at the time of bid submission and obtained before the supply as per Technical Specifications mentioned in the RFP

Note:

- For any copper cable termination weather, it is in PDU OR MCB or any kind of equipment termination the end notch of cable should be fitted with safety lugs to prevent further any kind of threat or short circuit.

- For the FDMS rack ideally power termination not required.

XV. Technical Specifications for 8.0/ 7.0-meter long RCC pole working load of 115 Kgs

The specification covers manufacture, curing, testing and supply of 8.0/7.0 meter long RCC poles, are generally as per drawing enclosed with the specification and are intended to be used. The materials manufactured shall conform strictly to the requirement of relevant INDIANSTANDARDS and latest addition of IS using the best quality of materials and workmanship. The Cement used in the manufacture of RCC Poles shall be of good quality and confirming to the relevant ISS either ordinary or rapid hardening Portland cement conforming to IS: 269. Aggregate used for the manufacture of RCC Poles shall confirm to IS:
383. Reinforcing bars and wires used in the manufacture of RCC Poles shall be as below: -

i) Mild steel and medium tensile steel bars and hard drawn steel wire confirming to IS- 432/1960

ii) The steel of Tor-50 grades conforming to latest edition of IS: 1786

iii) Quality of MS Rounds used for stirrups shall comply with the requirements of IS:226

The reinforcing bars used shall be of required length as per drawing and no joint shall be allowed. All joints and stirrups shall be welded properly. If no welded, the lap length shall not be less than 40 times the diameter of the bars. The cover of concrete over the reinforcement shall be 30mm under normal working conditions and shall not be under any circumstances less than 20mm.

The sand shall be of the quality fit for use in RCC works i.e., river sand and sieved and free from alkaline/acidic materials. The ratio of cement concrete shall be 1:2:3 and shall comply with the requirements of IS:456.
The standards adopted for various materials manufacture shall be as follows:

i) The RCC poles shall conform to the requirement of IS:785/1964

ii) The quality of concrete shall be to the requirements of IS:456/1964

iii) The testing of proto-type poles shall be as per requirements of IS:2905/1966

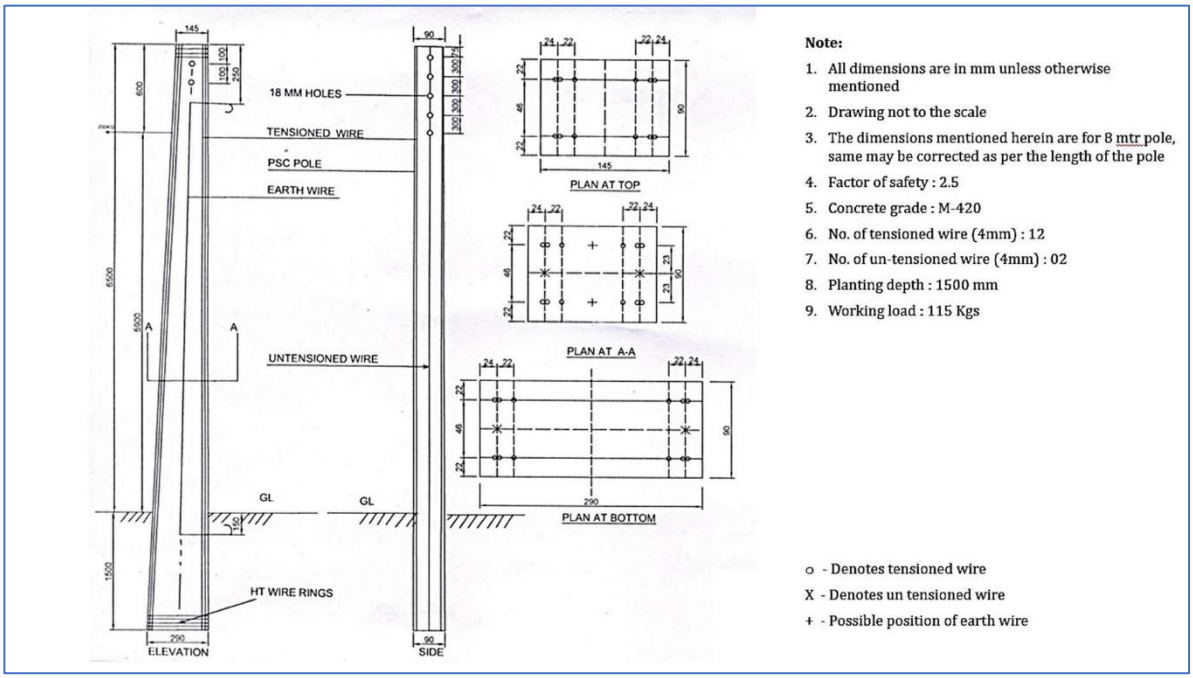
The RCC Poles shall be manufactured as per the drawing mentioned below.
The poles shall take working load 115 Kgs for 8.0/7.0 meters, long RCC pole acting at 0.6 M from top with factor of safety of 2.5 respectively and
The tests for transverse strength, torsion strength, measurement of cover and uprightness shall be carried out in the presence of a representative of BSNL/IE.
1.1 % of the total number of poles ordered and selected at random shall be tested as per the
BIS standard referred above. The PIA or the manufacturer of poles shall offer a lot of upto 500 poles to QA team for testing. The QA team will draw a sample of 1% of the offered lot and carry out the tests as per test standards referred above . The tests for which the test facilities are available at the manufacturer premises may be carried out and tests for which test facility is not available in the manufacturer premises, sample may be sent to external lab. After testing the offered lot may be cleared by QA based on test results as per norms of QA .
No payments will be made for the poles, which fail or tested to destruction.

Earthing shall be provided for the poles. By having a continuous separate length of SWG GI wire embedded in concrete during manufacture and the ends of wire left projecting from the narrower end of the poles and 150mm below the ground level. The arrangements for termination of the earth wire to the bolt and nut shall be as indicated in the concerned drawing. The G.I. Wire used for embedding shall comply with requirement of IS: 2141/1968.
The poles shall be clearly and indelibly marked with the following particulars, during
manufacture but before testing at a position so as to be easily seen after erection in position.

a. Month and year of manufacture
b. Maker's Sl. No. and marking
c. Purchase order No. and date
d. A line to indicate the depth of planting
e. BHARATNET engraved (letters – OWNER)

Provisions for holes for fixing the cross arms and other fixtures shall confirm to drawing and/or the industry construction practice. The universal pole clamp and ADSS accessories are to be used for slinging of ADSS OFC as per E.I

Drawing:


18 MM HOLES
TENSIONED WIRE
PSC POLE
EARTH WIRE
UNTENSIONED WIRE
HT WIRE RINGS
GL
GL
ELEVATION
SIDE
PLAN AT TOP
PLAN AT A-A
PLAN AT BOTTOM
Note:
1. All dimensions are in mm unless otherwise mentioned
2. Drawing not to the scale
3. The dimensions mentioned herein are for 8 mtr pole, same may be corrected as per the length of the pole
4. Factor of safety : 2.5
5. Concrete grade : M-420
6. No. of tensioned wire (4mm) : 12
7. No. of un-tensioned wire (4mm) : 02
8. Planting depth : 1500 mm
9. Working load : 115 Kgs
o - Denotes tensioned wire
X - Denotes un tensioned wire
+ - Possible position of earth wire

XII. Technical Specification for Armoured Ribbon Optical Fibre Cable for Underground Duct Application

1. Introduction:

1.1 This document describes the Standard for generic requirements of Armoured Ribbon Optical Fibre Cable for underground installation in ducts. A ribbon shall have six fibres. Semi-Dry Core Cable type has been mentioned in these specifications. The optical fibre

cables shall be suitably protected for the ingress of moisture by suitable water blocking material. The raw material used in the cable shall meet the requirements of the GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any).

1.2 The TEC GR/ Standard for the product (Armoured Ribbon Optical Fibre Cable for Underground Duct Application) is TEC 85260:2024 with latest amendments. ~~under preparation. Till finalization of the TEC GR/ Standard, Technical Specifications as mentioned in this section shall be applicable. After, finalization of the TEC GR/ Standard, any additional requirement shall be made applicable with mutual consent.~~

2. Functional Requirements:

2.1 The design and construction of Optical fibre cable shall be inherently robust and rigid under all conditions of installation, operation, adjustment, replacement, storage and transport.

2.2 The Optical fibre cable shall be able to work in a saline atmosphere in coastal areas and should be protected against corrosion.

2.3 Life of cable shall be at least 25 years. Necessary statistical calculations shall be submitted by the manufacturer. The cable shall meet the cable aging test requirement.

2.4 The Optical fibre cable shall be manufactured so as to protect the cable from rodent and termite.

2.5 It shall be possible to operate and handle the Optical fibre cable with tools as per Standard No. TEC 89060:2006 (latest release) and subsequent amendments, if any. If any special tool is required for operating and handling this optical fibre cable, the same shall be provided, in sufficient numbers as per requirement, along with the cable.

2.6 The Optical fibre cable supplied shall be suitable and compatible to match with the dimensions, fixing, terminating & splicing arrangement of the Splice closure.

2.7 The manufacturer shall submit an undertaking that the optical and mechanical fibre characteristics shall not change during the lifetime of the cable against the manufacturing defects.

2.8 It is mandatory that the Optical fibre cable supplied in a particular route is manufactured from a single source of optical fibres.

3. Technical Requirements:

Single Mode Optical Fibre used in manufacturing optical fibre cables shall be as per ITU-T Rec. G 652 D or G.657 A1. The specifications of optical fibre are mentioned below:

3.1 Type of fibre (Wavelength band optimized nominal 1310 nm):

Single mode as per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any

3.2 Geometrical Characteristics of fibre:

As per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any. All the parametric values shall be as per the Standard for GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any)

3.3 Transmission Characteristics of fibre:

As per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any. All the parametric values shall be as per the Standard for GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any)

3.4 Mechanical Characteristics of fibre:

As per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any. All the parametric values shall be as per the Standard for GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any)

3.5 Material Properties of fibre:

As per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any. All the parametric values shall be as per the Standard for GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any)

3.6 Environmental Characteristics of Fibre:

As per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any. All the parametric values shall be as per the Standard for GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any)

3.7 Colour Qualification and Primary coating Test:

As per Section-I of the Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any. All the parametric values shall be as per the Standard for GR for raw materials (Standard No. TEC 89010:2021(or latest release) and subsequent amendments, if any)

3.8 Ribbon Structure:

3.8.1 Six primary coated fibres shall be arranged in ribbon structure. The fibres in the structure shall be parallel and shall not cross over each other along the entire length of the ribbon. The dimensions of 6 fibres ribbon shall be as per the sectional specification of IEC 60794- 3 / Bell Core document no. GR-20Core issue 4, 2013 (latest version) and as given below:

3.8.2 Ribbon Dimensions: The maximum dimensions of fibre ribbon shall be as follows and the cross section geometry of the fibre ribbon shall be as shown in the following figure:

Number of Fibres	Ribbon Width (W)	Ribbon Height (H)	Extreme Fibres (B)	Planarity (P)
6	1648 µm	360 µm	1310 µm	50 µm

3.8.3 Ribbon Material: The ribbon shall be manufactured using single mode optical fibres coloured with UV cured resin and the ribbon shall be encapsulated with a further layer of UV cured acrylate. The fibres and the ribbons shall confirm to the colour requirement as per clause no. 5.4 of this GR.

3.8.4 Ribbon Mechanical Properties:

3.8.4.1 Ribbon Macro-bend:

Change in attenuation when wrapped on a 60 mm: < 0.05 dB diameter mandrel for 100 turns at 1310 & 1550 nm.

3.8.4.2 Ribbon Compression Resistance:

Change in attenuation when subjected to a compressive: < 0.05 dB load of 500 N at 1310 nm & at 1550 nm

3.8.4.3 Ribbon Torsion Resistance

Change in attenuation (At 1310 nm & 1550 nm) : < 0.05 dB

3.9 Ribbon Optical fibre Cable Construction Specifications for Semi Dry Core

The cable shall be designed to the parameters mentioned in Annexure – I. The manufacturer shall submit designed calculations and the same shall be studied and checked.
TYPICAL STRUCTURAL DRAWING FOR 48 FIBRE OF SEMI DRY CORE CABLE



3.9.1 Secondary Protection: The primary coated Ribbon fibres may be protected by loose packaging within tube, which shall be filled with thixotropic jelly. The dimensions of tube shall be as per Annexure – I.

3.9.2 Number of fibres in cable: 48, 96, 144, 216, 288

(Type Approval for a cable shall be issued depending upon the no. of fibres in the cable).

a. Number of fibres per ribbon: Six (6) Fibres

b. The number of ribbons per loose tube in ribbon optical fibre cable shall be as follows:

S. No	No. of Fibres	Ribbon Per Tube	Multi loose tube type
a.	48 oibres	2 ribbon per tube	4 tubes and 1 Filler
b.	96 oibres	4 ribbon per tube	4 tubes and 1 Filler
c.	144 oibres	6 ribbon per tube	4 tubes and 1 Filler
d.	216 oibres	6 ribbon per tube	6 tubes
e.	288 oibres	6 ribbon per tube	8 tubes

3.9.3 Strength Member: Solid FRP non - metallic strength member shall be used in the center of the cable core. The strength member in the cable shall be for strength and flexibility of the cable and shall have anti buckling properties. The FRP shall keep the fibre strain within permissible values. The FRP central strength member shall be as per the Standard No. TEC 89010:2021(or latest release) and the subsequent amendments, if any. The size of FRP shall be as per Annexure – I.

3.9.4 Moisture barrier (protection) over FRP: The water swellable yarn shall be binded over FRP. The specification of WS yarn shall be as per section XIX of Standard No. TEC 89010:2021(or latest release) and the subsequent amendments issued, if any.

3.9.5 Cable Core Assembly: Primary coated fibres in ribbon structure shall be protected inside loose tubes which are stranded together around a central strength member using helical or reverse lay techniques and form the cable core. The dimensions of FRP and stranding pitch shall be as per Annexure – I. The nylon/polyester binder thread shall be used to hold the cable core, if required.

3.9.6 Core Wrapping: The main cable core shall be wrapped by a layer/layers of water swellable tape. The water swellable(blocking) tape shall be as per Section-XIV of Standard No. TEC 89010:2021(or latest release) and the subsequent amendments, if any. The nylon/polyester binder thread shall be used to hold the tape, if required. The nylon/polyester binder thread shall be as per Section-IX of Standard No. TEC 89010:2021(or latest release) and the subsequent amendments, if any. The core wrapping shall not adhere to the secondary fibre coating and shall not leave any kink marks over the loose tube.

3.9.7 Filling compound: The filling compound used in the loose tube shall be compatible to fibre and secondary protection of fibre of the cable. The drip point shall not be lower than
+70°C. The fibre movement shall not be constrained by stickiness and shall be easily removable for splicing. Reference test method to measure drop point shall be as per ASTM D 566. The thixotropic filling compound (jelly) shall be as per the Standard No. TEC 89010:2021(or latest release) and subsequent amendments issued, if any.

3.9.8 Glass Reinforcement: Impregnated Glass Fibre Reinforcement are used to achieve the required tensile strength of the optic fibre cables over the cable core wrapping to provide peripheral reinforcement along with Solid Rigid FRP Rod in the centre at cable core. The use of Solid Rigid FRP Rod(s) is mandatory in Optical Fibre cable design. Impregnated Glass Fibre Reinforcement used shall be equally distributed over the periphery of the cable core wrapping. The quantity of the Impregnated Glass fibre Reinforcement used per km length of the cable along with its dimensions shall be as per Annexure-I. The specification of the glass roving shall be as per Section XII of Standard No. TEC 89010:2021(or latest release) and subsequent amendments issued, if any and as per other details given in the Annexure–I.

3.9.9 Armouring: Armouring shall be provided by corrugated ECCS Tape (Electrolytically Chrome Coated Steel) to make the cable protected from rodent and termite. The armour shall also provide the sufficient radial as well as compressive strength and the armour shall be electrically continuous and bonded to the outer sheath. The force of adhesion shall be minimum 14 Newton and shall be tested as per ASTM D- 4565 test method.

3.9.9.1 The ECCS Tape armouring corrugated transversely for lateral strength and bending flexibility shall be applied longitudinally with an overlap of 10% (MIN) over the main cable core. The corrugation over the entire length of the tape shall be uniform. The overlap portion of the cable armour shall be suitably protected for the ingress of the moisture (below the armour) by water swellable tape.

3.9.9.2 The height of corrugation shall be 0.6 mm (min) & the pitch of corrugated tape shall be
2.5 mm (max). Height and pitch of corrugation shall be measured between crest and trough base line.

3.9.9.3 The corrugated armouring of ECCS Tape shall offer excellent corrosive resistance The specifications of ECCS tape shall be as per Section-XV of the Standard No. TEC

89010:2021(or latest release) and subsequent amendments, if any .

3.9.10 Continuity of Metallic members: All metallic elements used in the cable (i.e. longitudinally applied tape) shall be electrically continuous.

3.9.11 Outer Sheath: A non-metallic moisture barrier sheath (black in colour) shall be applied over the armour, which shall consist of tough weather resistant made High Density Polyethylene compound (HDPE), UV stabilized. The colour shall confirm to Munsell colour standards. The thickness of the outer sheath shall not be less than 1.8 mm and the strength members embedded with in the sheath. The outer sheath shall be uniform, circular, smooth, free from pin holes, joints mended pieces and other defects. The reference test method to measure thickness shall be as per IEC 60811-202.

Note1: HDPE material from finished product shall be subjected to following tests (on sample basis) and shall confirm to the requirement of the material as per Section III of Standard No. TEC 89010:2021(or latest release) and the subsequent amendments, if any:

i) Density
ii) Melt flow index
iii) Oxidative Induction time
iv) Carbon black content
v) Carbon black dispersion
vi) ESCR
vii) Moisture content
viii) Tensile strength and elongation at break
ix) Absorption Coefficient
x) Brittleness Temperature

Note 2: The outer jacket of HDPE shall be as to protect the sheath from attack by termites. Manufacturer shall ensure that doping material/additives used if any, are non-toxic and non-hazardous. The surface of the sheath shall be smooth and free of defects such as cracks, blisters, etc.

3.9.12 Cable diameter: The finished cable diameter shall be as per Annexure-I.

3.9.13 Cable Weight: The nominal cable weight shall be as per Annexure – I.

3.9.14 RIP Cord:

a) The minimum two suitable ripcords, diametrically opposite to each other, shall be provided in the cable, which shall be used to open the HDPE sheath and armour of the cable. It shall be capable of consistently slitting the sheath

without breaking for a length of 1 meter at the installation temperature. The ripcords (3ply & twisted) shall be nonwicking type and shall not work as a water carrier.

b) The ripcords used in the cable shall be readily distinguishable from any other components utilized in the cable construction.

4 Mechanical Characteristics and Tests on Optical Fibre Cable:

(Note: All observations are to be taken at 1310nm and 1550nm wavelengths)

4.1 Tensile strength Test:

Objective: This measuring method applies to optical fibre cables which are tested at a particular tensile strength in order to examine the behaviour of the attenuation as a function of the load on a cable which may occur during installation.

Method: IEC 60794-1-21-E1

Test Specs.: The cable shall have sufficient strength to withstand a load of value T(N) = 3000N. The load shall be sustained for 10 minutes and the strain of the fibre monitored.

Requirement: The load shall not produce a strain exceeding 0.25% in the fibre and shall not cause any permanent physical and optical damage to any component of the cable. The attenuation shall be noted before and after the release of load. The change in attenuation of each fibre after the test shall be ≤ 0.05 dB both for 1310 nm and 1550 nm wavelength.

4.2 Abrasion Test:

Objective: To test the abrasion resistance of the sheath and the marking printed on the surface of the cable.

Method: IEC-60794-1-21-E2

Test Specs.: The cable surface shall be abraded with needle (wt. 150 gm) having diameter of 1 mm with 500 grams weight (Total weight more than equal 650 gms.)
No. of cycles : 100

Duration : One minute (Nominal)

Requirement: There shall be no perforation & loss of legibility of the marking on the sheath.

4.3 Crush Test (Compressive Test):

Objective: The purpose of this test is to determine the ability of an optical fibre cable to withstand crushing.

Method: IEC 60794-1-21-E3

Test Specs.: The fibres and component parts of the cable shall not suffer permanent damage when subjected to a compressive load of 2000 Newton applied between the plates of dimension 100 mm x 100 mm. The load shall be applied for 10 minutes. The attenuation shall be noted before and after the completion of the test.

Requirement: The change in attenuation of the fibre after the test shall be ≤0.05 dB both for 1310 nm and 1550 nm wavelength.

4.4 Impact Test:

Objective: The purpose of this test is to determine the ability of an optical fibre cable to

withstand impact.

Method: IEC 60794-1-21-E4

Test Specs: The cable shall have sufficient strength to withstand an impact caused by a mass weight of 50 Newton, when falls freely from a height of 0.5 meters. The radius R of the surface causing impact shall be 300 mm. 10 such impacts shall be applied on the cable at different locations typically spaced not less than 500mm apart.. The attenuation shall be noted before and after the completion of the test.

Requirement: The change in attenuation of the fibre after the test shall be ≤ 0.05dB both for 1310 nm and 1550 nm wavelength.

4.5 Repeated Bending Test:

Objective: The purpose of this test is to determine the ability of an optical fibre cable to withstand repeated bending.

Method: IEC 60794-1-21-E6

Test Specs.: The cable sample shall be of sufficient length (5 m minimum) to permit radiant power measurements as required by this test. Longer lengths may be used if required.

Parameters:

Length of Cable sample : 5m (minimum)
Load : as per FOTP-104
Minimum distance from Pulley :216mm centre to holding device
Minimum distance from Wt. to : 457mm Pulley centre

Pulley Diameter :
(D - cable diameter)

20 D

Angle of Turning : 90o
No. of cycles : 30
Time Required for 30 cycles : 1 min

Requirement: During the test no fibre shall break and the attenuation shall be noted before and after the completion of the test. The change in attenuation of the fibre after the test shall be ≤ 0.05 dB both for 1310 nm and 1550 nm wavelength.

4.6 Torsion Test:

Objective: The purpose of this test is to determine the ability of an optical fibre cable to withstand torsion.

Method: IEC 60794-1-21-E7

Test Specs.: The length of the specimen under rest shall be 2 meters and the load shall be

100 N. The sample shall be mounted in the test apparatus with cable clamped in the fixed clamp sufficiently tight to prevent the movement of cable sheath during the test. One end of the cable shall be fixed to the rotating clamp which shall be rotated in a clock wise direction for one turn. The sample shall then be returned to the starting position and then rotated in an anti-clock wise direction for one turn and returned to the starting position. This complete movement constitutes one cycle. The cable shall withstand 10 such complete cycles. The attenuation shall be noted before and after the completion of the test.

Requirement: The cable shall be examined physically for any cracks tearing on the outer sheath and for the damage to other component ports of the cable. The twist mark shall not be taken as damage. The change in attenuation of the fibre after the test shall be ≤ 0.05 dB both for 1310 nm and 1550 nm wavelength.

4.7 Kink Test:

Objective: The purpose of this test is to verify whether kinking of an optical fibre cable results in breakage of any fibre, when a loop is formed of dimension small enough to induce a kink on the sheath.

Method: IEC 60794-1-21-E10

Test Specs.: The sample length shall be 10 times the minimum bending radius of the cable The sample is held in both hands, a loop is made of a bigger diameter and by stretching both the ends of the cable in opposite direction, the loop is made to the minimum bend radius so that no kink shall form. After the cable comes in normal condition, the attenuation reading is taken.

Requirement: The kink should disappear after the cable comes in normal condition. The change in attenuation of the fibre after test shall be ≤ 0.05 dB both for 1310 nm & 1550 nm wavelength.

4.8 Cable Bend Test:

Objective: The purpose of this test is to determine the ability of an optical fibre cable to withstand repeated flexing. The procedure is designed to measure optical transmittance changes and requires an assessment of any damage occurring to other cable components.

Method: IEC 60794-1-21-E11 (Procedure-I).

Test Specs.: The fibre and the component parts of the cable shall not suffer permanent damage when the cable is repeatedly wrapped and unwrapped 4 complete turns of 10 complete cycles around a mandrel of 20 D, where D is the diameter of the cable. The attenuation shall be noted before and after the completion of the test.

Requirement: The change in attenuation of the fibre after the test shall be ≤ 0.05 dB both for 1310 nm and 1550 nm wavelength. Sheath shall not show any cracks visible to the naked eye when examined whilst still wrapped on the mandrel

4.9 Test of Figure of 8 (Eight) on the cable (Type Test):

Objective: Check of easiness in formation of figure of 8 of the cable during installation in the field.

Test Method: 1000 meter (approximate) of the cable shall be uncoiled from the cable reel and shall be arranged in figure of 8 (eight). The diameter of each loop of the figure of 8 shall be maximum 2 meters.

Requirement: It shall be possible to make figure of 8 of minimum 1000meter length of the cable uncoiled from the cable reel, without any difficulty. No visible damage shall occur.

4.10 Temperature Cycling (Type Test):

Objective: To determine the stability behaviour of the attenuation of a cable subjected to temperature changes which may occur during storage, transportation and usage.

Method: IEC 60794-1-22-F1 (To be tested on Standard cable length & drum i.e 2Km. ± 5%)

Test Specs.: The permissible temperature range for storage and operation will be from -20°C to +70°C. The rate of change of temperature during the test shall be 1°C per minute approx. The cable shall be subjected to temperature cycling for 12 Hrs. at each temperature as given below:

TA2 temp. : -20°C

TA1 temp. : - 10°C.

TB1 temp. : + 60°C.

TB2 temp. : + 70°C.

The test shall be conducted for 2 cycles at the above temperatures.

Requirement: The change in attenuation of the fibre under test shall be ≤ 0.05 dB for 1310 nm and 1550 nm wave length respectively for the entire range of temperature.

4.11 Cable aging Test (Type Test):

Objective: To check the cable material change dimensionally as the cable ages.
Method: IEC 60794-1-22-F9

Test Specs.: At the completion of temperature cycle test, the test cable shall be exposed to 85
± 2 degree C for 168 hours. The attenuation measurement at 1310 & 1550 nm wave length to be made after stabilization of the test cable at ambient temperature for 24 hours.

Requirement: The increase in attenuation shall be ≤0.05 dB at 1310 and 1550 nm.

Note: The attenuation changes are to be calculated with respect to the base line attenuation values measured at room temperature before temperature cycling.

4.12 Water Penetration Test (Type Test):

Objective: The aim of this test is to ensure that installed Optical Fibre cable will not allow water passage along its length.

Method: IEC 60794-1-22-F5

Test Specs.: A circumferential portion of the cable end shall face the water head. The water tight sleeve shall be applied over the cable. The cable shall be supported horizontally and two-meter head of water, containing a sufficient quantity of water-soluble fluorescent dye for the detection of seepage, shall be applied on the HDPE sheath for a period of 7 days at ambient temperature. No other-coloured dye is permitted.

Requirement: No dye shall be detected when the end of the 3m length of the cable is examined with ultraviolet light detector.

4.13 Flexural Rigidity Test on the optical fibre cable (Type Test):

Objective: To check the Flexural Rigidity of the metal free optical fibre cable.

Method: To be tested as per ASTM D –790

Test Specs: The fibre and the component parts of the cable shall not suffer permanent damage in the cable subjected to Flexural Rigidity Test as per the above method. The attenuation shall be noted after and before the completion of the test.

Requirement: The change in attenuation of the fibre after the test shall be < 0.05 dB at 1310, 1550 nm and 1625nm wavelengths. The sheath shall not show any cracks visible to the naked eye.

4.14 Static Bend test (Type Test):

Objective: To check the cable under Static bend.

Method: As per the clause no 4.8 of the GR alternatively as per ASTM D790.

Test Specs: The cable shall be subjected to static bend test. The optical fibre cable shall be bend on a mandrel having a Diameter of 10 D (D is diameter of the cable).

Requirement: The change in attenuation of the fibre after the test shall be <0.05 dB for 1310, 1550 nm and 1625nm wavelengths. Sheath shall not show any cracks visible to the naked eye when examined whilst still wrapped on the mandrel.

4.15 Cable Jacket Yield Strength And Ultimate Elongation:

Objective: To determine the yield strength and elongation of the polyethylene (HDPE) cable sheath (jacket).

Test Method: FOTP-89 or ASTM 1248 Type III class

Test Condition: 1. Sample shall be taken from a completed cable. The aged sample shall be conditioned at 100 ± 2°C for 120 hours before testing. 2. The cross-head speed

shall be 50 mm per minute.

Requirement:

Jacket Material	Minimum Yield Strength		Minimum Elongation (%)
	(MPa)	(psi)	
HDPE un-aged	16.5	2400	400
HDPE aged	12.4	1800	375

4.16 Ribbon Dimension Measurements test: (Type Test)

Objective: To Check the fibres in ribbon structure, fibre cross over and fibre identity to ensure the transmission performance and the mechanical service life of the fibre in the ribbon structure.

Test Method: As per extant method of BSNL QA.

Requirement: It shall meet the dimensional requirements given in clause no. 3.8.2 of this GR. The fibres in the entire length of the ribbon shall not cross over at any point.

4.17 Ribbon Resistance to Twist (Robustness) test: (Type Test)

Objective: To check the robustness of the fibre ribbons to withstand the twist in installed conditions and to check the structural integrity of the ribbon over the deployed length for mid-span entry, maintenance purposes, consideration in rearrangements and housekeeping.

Test Method: As per extant method of BSNL QA.

Requirement: The un-aged and aged (at 85 + 2 degree C with uncontrolled humidity for a period of 30 days) completed ribbon shall not show any separation of individual fibres from the ribbon structure after completion of the twist test when observed under 5X magnification.

4.18 Ribbon Residual Twist (Flatness) Test: (Type Test)

Objective: To check the dimensional integrity of the ribbon without twisting to allow rearrangements and to limit the potential attenuation increases due to a macro- bending caused by twisting of the fibre ribbon.

Test Method: As per extant method of BSNL QA.

Requirement: The aged (at 85º + 2º C with uncontrolled humidity for a period of 30 days) ribbon residual twist (if any) shall have a pitch: > 400 mm.

4.19 Ribbon Separation Test:

Objective: (a) To check the separation of individual fibres, separation of sub-unit of fibres and mid span separation from a fibre ribbon.

(b) To check the retention of sufficient colorant for identification for any 2.5 cm length of fibre after separation for individual and sub-unit of fibres.

Test Method: As per extant method of BSNL QA. Test to be conducted for:

(a) Separation of any single fibre or a multi-fibre subgroup by a tool or by hand from a ribbon for a length of 1 meter. Mid span separation from a 2 meter sample, separated close to middle for at least 0.5 meter (both single fibre and the six fibre sub – units) for un-aged ribbon.

Requirement: The un-aged ribbon of minimum length of a 0.3 meter (1.0 foot) of an individual fibre and a sub group of six fibres shall be separated from the ribbon without breaking the fibres or damaging the fibre coating. The force required to perform separation shall not exceed 4.4 N. The area at the

separation shall not show any damage to the fibre coating when examined under 5X magnification.

(b) Retention of the Colourand Fibre Identification after separation.

Requirement: Individual fibre colour identification shall be maintained after the separation test. It shall retain sufficient colorant that any 2.5 cm length is readily identifiable.

(c) Removal of Ribbon matrix material to access individual fibres. Requirement: No damage shall occur either to fibre coating or the fibres. The coating shall not sustain any swelling self-stripping, cracking or splitting when examined under 5X magnification.

Note: The manufacturer shall recommend the procedure for the removal of ribbon matrix.

4.20 Ribbon Strippability Test:

Objective: Check of removal of the matrix material and the fibres protective coating mechanically with commercial stripping tools from unaged and aged ribbons.

Test Method: As per extant method of BSNL QA. Pre-Conditioning:

a. Aged samples: The humidity of aged ribbons shall be soaked at 85 + 2 degree C and a non-condensing humidity of 85 + 5% for a period of 30 days.

b. Water aged samples: The water aged ribbons shall be soaked in de-ionized or distilled water at a temperature of 23 + 5 degree for a period of 14 days.

The fibre ribbon strip-ability testing shall be conducted at standard atmospheric conditions. The un-aged, humidity – aged, and water aged ribbons shall be tested within eight hours after aging.

Requirement: There shall be no fibre breakage, and any coating residue shall be removable with a single isopropyl alcohol wipe when at least 25 mm of the matrix material and the fibre Protective coating is mechanically removed with commercial stripling tools from un-aged and aged ribbons.

4.21 Ribbon Macro-Bend Performance

Objective: To check the macro-bend performance of a ribbon. Test Method: As per extant method of BSNL QA.

Method: One hundred turns of ribbon are wound around a 60 mm diameter ribbon and the loss increase at 1310 nm & 1550 nm shall be measured.

Requirement: The change in attenuation of the fibre shall be < 0.05 dB, for 1310 nm and 1550 nm wave lengths.

4.22 Torsion Resistance of the ribbon (Type test): Objective: To check the torsion resistance of the ribbon. Test Method: As per extant method of BSNL QA.
Method: One-meter length of ribbon is twisted to through five revolutions of 360°and measurement is taken.

Requirement: The change in attenuation of the fibre shall be < 0.05 dB, for 1310 nm and 1550 nm wave lengths.

4.23 Crush Resistance of Ribbon (Type Test): Objective: To check the crush resistance of the ribbon.
Method: A 50 mm2 sample is subjected to a load of 500 N and the attenuation measurement taken for both 1310 nm & 1550 nm wave lengths.

Requirement: The change in attenuation of the fibre shall be < 0.05 dB, for 1310 nm and 1550 nm wave lengths.

4.24 Check of the quality of the loose tube (containing optical fibre ribbon) (Type Test):

a. Embrittlement Test of Loose Tube

This test method is based on bending by compression and reflects embrittlement much better than the other tensile tests. This test is independent of wall thickness of the loose tube.

Sample: The minimum length of the test sample depends on the outside diameter of the loose tube and should be 85 mm for tubes up to 2.5 mm outside dia. The length of the bigger tubes should be calculated by using the following equation:

Lo > , Where

Lo = Length of tube under test. D = Outside dia of loose tube.
d = Inside dia of loose tube.

Procedure: Both the ends of a buffer tube test sample may be mounted in a tool, which is clamped in jaws of a tensile machine which exerts a constant rate of movement. The movable jaw may move at a rate of 50 mm per minute toward the fixed jaw. Under load, the tube will bend so that it is subjected to tensile and compressive stresses. The fixture for holding the tube should be designed in a manner that the tube might bend in all directions without further loading.

Requirement: The tube should not get embrittled. No kink should appear on the tube up to the safe bend diameter of tube (15 D), where D is the outside diameter of the loose tube. There should also not be any physical damage or mark on the tube surface.

b. Kink Resistance Test on the Loose Tube

Objective: To safeguard the delicate optical fibres, the quality of the loose tube material should be such that no kink or damage to the tube occur while it is being handled during installation and in splicing operations.

Method: IEC 60794-1-23-G7

Procedure: To check the kink resistance of the loose tube, a longer length of the loose tube is taken (with fibre and gel), a loop is made and loop is reduced to the minimum bend radius of loose tube i.e. 15 D (where D is the outside diameter of the loose tube). This test is to be repeated 4 times on the same sample length of the loose tube.

Requirement: No damage or kink should appear on the surface of the tube.

4.25 Drainage Test for Loose Tube and Drip test on the cable (Type Test):

a. Drainage Test for loose tube Method:
Sample Size: 30 cm tube length. Test procedure:
1. Cut the tube length to 40 cm.

2. Fill the tube with the tube filling gel ensuring that there are no air bubbles and the tube is completely full.

3. Place the filled tube in a horizontal position on a clean worktop and cut 5 cm from either end so that the finished length of the sample is 30 cm.

4. Leave the filled tube in a horizontal position at an ambient temperature for 24 hrs. (This is necessary because the gel has been sheared and the viscosity has been reduced during the filling process).

5. The sample tube is then suspended vertically in an environment heat oven over a weighed beaker. It is left in the oven at a temperature of 70° C for a period of 24 Hrs.

6. At the end of the 24 hrs period the beaker is checked and weighed to see if there is any gel in the beaker.

Requirement:

1. If there is no gel or oil in the beaker, then tube has PASSED the drainage test.

2. If there is gel or oil in the beaker, then tube has FAILED the drainage test.

b. Drip test on the cable

Objective: The purpose of this test is to determine the ability of jelly in the O.F. cable to withstand a temperature of 70-degree C.

Method: IEC 60794-1-22-F16

Test Specs.: Take a sample of 30 cm. length of the cable with one end sealed by end cap.
Remove outer black sheath, binder tapes for 5 cm from open end of the sample. Clean the jelly. Then the sample is kept vertically with open end downwards in the oven for 24 hours at 70o C with a paper under the sample.

Requirement: Examine the paper placed below the cable inside the oven for dripping of the jelly after 24 hours. There should be no jelly drip or oily impression on the paper.

4.26 Check of easy removal of sheath:

Objective: Check of the easy removal of sheath of the optical fibre cable by using normal sheath removal tool.

Procedure: To check easy removal, about 300 mm length of the sheath should be removed by use of rip cords. It should be observed during sheath removal process that the cable core should not be damaged during the operation. One should be able to remove the sheath easily.

4.27 Check of the effect of aggressive media on the cable (Acidic and Alkaline Behaviour) (Type Test):

Procedure: To check the effect of aggressive media, solution of PH4 and PH10 shall be made.
The two test samples of the finished cable, each of 600 mm in length, are taken and the ends of the samples are sealed. These test samples are put in the PH4 and PH10 solutions separately. After 30 days these samples are taken out from the solutions and examined for any corrosion etc on the sheath and other markings of

the cables. (Test method no. ISO175).

Requirement: The sample should not show any effect of these solution on the sheath and other marking of the cable.

4.28 Sheath to ground dielectric strength test:

Objective: To confirm that the cable sheath is continuous and free from pin holes. Test Specs.: The dielectric strength shall be 8KV RMS or 12 KV DC when spark tested. Method: IEC 62230
Requirement: The cable shall pass the test.

4.29 Electrical Continuity Test :

Objective: The aim of this test is to ensure that all the metallic elements used in the cable are electrically continuous throughout the cable.

Method: IEC 60794-1-403

Procedure: Strip and open both the ends of the cable (for a short distance sufficient enough to access the inner metallic elements) and connect the test apparatus to the metallic members to complete the test circuit.

Requirements: All the metallic elements used in the cable shall be electrically continuous.

5 Engineering Requirements:

5.1 Cable Marking:

5.1.1 A long lasting suitable marking shall be applied in order to identify this cable from other cables. The cable marking shall be imprinted (indented). The marking on the cable shall be indelible of durable quality and at regular intervals of one meter length. The accuracy of the sequential marking must be within -0.25% to +0.5% of the actual measured length. The sequential length markings must not rub off during normal installation and in life time of optical fibre cable. The total length of the cable supplied shall not be in negative tolerance.

5.1.2 The marking shall be in contrast colour over the black HDPE Sheath (jacket) and shall be one by hot foil indentation method. The colour used must withstand the environmental influences experienced in the field. The marking on the cable shall be permanent, insoluble in water and shall be legible for duration of cable life.

5.1.3 The type of legend marking on O.F. cable shall be as follows:

a) Company Legend

b) Legend containing telephone mark & international acceptable Laser symbol

c) Type of Fibre – G.652 D / G.657 A1

d) Number of Fibres

e) Type of cable

f) Year of manufacture

g) Sequential length marking

h) User's Identification

i) Cable ID

5.2 Cable Ends:

5.2.1 Both cable ends (the beginning end and end of the cable reel) shall be sealed and readily accessible. Minimum 5 meter of the cable of the beginning end of the reel shall accessible for testing. Both ends of the cable shall be kept inside the drums and shall be located so as to be easily accessible for the test. The drum (confirming to GR No. G/CBD- 01/02 NOV 94 (latest release) and subsequent amendments, if any) should be marked to identify the direction of rotation of the drum. Both ends of cable shall be provided with cable pulling (grip) stocking and the anti twist device (free head hook). The wooden drums shall be properly treated against termites and other insects during transportation and storage. The manufacturer shall submit the methodology used for the same

5.2.2 An anti-twist device (Free head hook) shall be provided, attached to the both the ends of the cable pulling arrangement. The arrangement of the pulling eye and its coupling system along with the anti-twist system shall withstand the prescribed tensile load applicable to the cable.

5.3 The nominal drum length:

5.3.1 Length of OF Cable in each drum shall be 2 Km / 4Km / 8Km / 10Km shall be supplied as per the order. The variation in length of optical fibre cable in each drum shall be ± 5% to ± 10%, as decided by the purchaser. Purchaser may at their discretion procure shorter length cable drum as per their requirement.

5.3.2 The fibres in cable length shall not have any joint.

5.3.3 The drum shall be marked with arrows to indicate the direction of rotation.

5.3.4 Packing list supplied with each drum shall have at least the following information:

a) Drum No.

b) Type of cables

c) Physical Cable length

d) No. of fibres

e) Length of each fibre as measured by OTDR

f) The Cable factor - ratio of fibre/cable length

g) Attenuation per Km. of each fibre at 1310 & 1550 nm

h) Users / Consignee's Name

i) Manufacturers Name, Month, Year and Batch No.

j) Group refractive index of fibre.

k) Purchase Order No.

l) Cable ID

5.4 Colour coding and Ribbon identification in O.F. Cables:

5.4.1 The colorant applied to individual fibres shall be readily identifiable throughout the life time of the cable and shall match and conform to the MUNSELL color standards (EIA- 598D) and also IEC Publication 304(4).

5.4.2 Colour Coding Scheme:

When the loose tubes are placed in circular format, the marking to indicate the loose tube no. "1" shall be in blue colour followed by loose tube no.2 of orange and so on for other tubes as per the colour scheme given below at Table-1 and complete the circular format by placing the dummy /fillers at the end.

Table -1: Colour Coding scheme of Loose tube

Loose tube No./Sequence	Loose tube identi6ication
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White
7	Red
8	Black
9	Yellow

10	Violet
11	Rose/Pink
12	Aqua

Depending upon the number of fibres in a Ribbon (which depends on the cable capacity), the fibres within each Ribbon are serially chosen starting from blue colour as per the colour scheme given below at Table-2.

Table-2: Colour Coding scheme of the Optical Fibre within Ribbon

Fiber No./Sequence within Ribbon	Fibre Identi6ication
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White
7	Red
8	Black
9	Yellow
10	Violet
11	Rose/Pink
12	Aqua

5.2.1 Identification of Ribbon:

No. of 6ibre in a Cable	No. of Tubes	No. of Ribbon per Tube	Fiber Per Ribbon	Marking on Ribbon
48 Fibres	4 Tubes 1 Filler	2	6	Individual Ribbon shall be printed with respective number as 1, 2.
96 Fibres	4 Tubes 1 Filler	4	6	Individual Ribbon shall be printed with respective number as 1, 2, 3, 4.
144 Fibres	4 Tubes 1 Filler	6	6	Individual Ribbon shall be printed with respective number as 1, 2, 3, 4, 5, 6.

216 Fibres	6 Tubes	6	6	Individual Ribbon shall be printed with respective number as 1, 2, 3, 4, 5, 6.
288 Fibres	8 Tubes	6	6	Individual Ribbon shall be printed with respective number as 1, 2, 3, 4, 5, 6.

Note: The individual number marking shall be at regular interval of every 300 mm or lesser on natural color ribbon and shall be legible. The printing on the ribbon shall also be of durable quality and shall be compatible with coating of the ribbon and Thixotropic Jelly (filled in the loose tube of the cable).

6 Quality Requirements:

6.1 The cable shall be manufactured in accordance with the international quality standards ISO 9001-2015 or latest issue for which the manufacturer should be duly accredited. The Quality Manual shall be submitted by the manufacturer.

6.2 Raw Material:

6.2.1 The cable shall use the raw materials approved against the Standard No. TEC 89010:2021(or latest release) and the subsequent amendments issued, if any. The list and details of the Raw Materials used, the make and grade of the raw material and valid certificate of source approval issued by CACT or any Conformity Assessment Body(CAB) recognized by TEC, shall be submitted by the manufacturer.

6.2.2 Any other material used shall be clearly indicated by the manufacturer. The detailed technical specifications of such raw materials used shall be furnished by the manufacturer at the time of evaluation/testing.

6.2.3 The raw materials used from multiple sources is permitted and the source / sources of raw materials (Type and grade) from where these have been procured shall be submitted by the manufacturer.

6.2.4 The manufacturer can change the raw material from one approved source to other approved source with the approval of QA wing of purchaser. The change of source/grade of SM optical Fibre and/or design of cable shall call for fresh approval/certification. The clauses 10.2 and 10.3 of this Standard for GR shall

facilitate the clause 6.2.4 of this Standard for GR, in order to simplify the certification process and to avoid repetitive testing.

6.2.5 The raw material used (HDPE black in colour) for outer sheath shall protect the cable from attack by termite. The manufacturer shall specify anti-termite additives used if any, and submit the detail characteristics of the material and additives used to make it termite proof. The cable shall be tested for the presence of Anti- termites additives by recognised laboratory or institute. The additives/dopants used if any, shall be non-toxic and nonhazardous. The non-toxicity, thermal stability, half-life, efficacy etc. of additives/dopants shall be tested by recognized laboratory or institute. The

cable shall be tested for its termite proof-ness by recognised laboratory or institute.

6.2.6 The HDPE black in colour used for sheath shall be UV stabilised.

Note:

A test certificate from CACT or from any Conformity Assessment Body(CAB) recognized by TEC may be acceptable for the UV stability of the HDPE sheath material. Source Approval Certificate (SAC) issued by CACT against Standard No. TEC 89010:2021(or latest release) for the HDPE raw material used, indicating UV stabilized grade, may also be acceptable in this respect.

6.2.7 The material used in optical fibre cable must not evolve hydrogen that will affect the characteristics of optical fibres.

Note: A test certificate from a recognised laboratory or institute may be acceptable.

6.3 Cable Material Compatibility:

Optical fibre, buffers/core tubes, and other core components shall meet the requirements of the compatibility with buffer/core tube filling material(s) and/or water-blocking materials that are in direct contact with identified components within the cable structure (This shall be tested as per clause no. 6.3.3 of Telecordia document GR-20-CORE issue 4, July 2013 or as per IEC 60794-1-219).
Note: The tests may be conducted in house (if facility exist) or may be conducted at CACT or at any Conformity Assessment Body(CAB) recognized by TEC. The test certificate may be accepted and the tests may not be repeated

subsequently, in next type approvals, if the raw material used is of same make and grade.

7 Safety Requirements:

7.1 The material used in the manufacturing of the Optical fibre cables shall be non-toxic and dermatologically safe in its life time and shall not be hazardous to health. The manufacturer shall submit MSDS (Material safety Data Sheet) for all the material used in manufacturing of OF Cable to substantiate the statement.

ABBREVIATIONS

ASTM - American Society for Testing and Materials
BIS - Bureau of Indian Standards
CACT - Component Approval Centre For Telecommunications
dB - decibel
EIA - Electronic Industries Association
ESCR - Environmental Stress Crack Resistance
FRP - Fibre Rinforced Plastic
FOTP - Fibre Optic Test Procedure
HDPE - High Density Polyethylene
IEC - International Electro -Technical Commission
ISO - International Organization for standardization
ITU-T - International Telecommunication UnionTelecommunication Standardization Sector
MFD - Mode Field Diameter
MSDS - Material Safety Data Sheet
QA - Quality Assurance
SM - Single Mode
TEC - Telecommunication Engineering Centre
UV - Ultra Violet
µm - Micrometer
oC - Degree Celsius

Annexure - I

(Semi Dry Core Design)

The following parameters of the component of the cable are to be taken in to account while designing and manufacturing the

optical fibre cables of the required fibre count. These parameters shall be checked during evaluation of the OF cables.

SN	Parameter	Unit	48F Ribbon Fibre	96F Ribbon Fibre	144F Ribbon Fibre Cable	216F Ribbon Fibre Cable	288F Ribbon Fibre
1	FRP Rod EAA Coated	mm					
2	FRP Up-coating	mm					
3	Tube ID (min)	mm					
4	Tube OD	mm					
5	No of oibre / ribbon	No	6	6	6	6	6
6	No of Ribbon in a	No	2	4	6	6	6
7	Color of oibre per Ribbon		BL,OR, GR, BR,SL, W H	BL,OR, GR,BR, SL, WH	BL,OR, GR,BR, SL, WH	BL,OR, GR,BR, SL, WH	BL,OR, GR,BR, SL, WH
8	No of loose tubes	No	4 with 2 Ribbons	4 with 4 Ribbons	4 with 6 Ribbons	6 with 6 Ribbons	8 with 6 Ribbon
9	Colour of loose tubes		BL,OR, GR, BR	BL,OR, GR, BR	BL,OR, GR, BR	BL,OR, GR, BR, SL, WH	BL,OR,GR,BR,SL,WH
10	No of dummy cord	No	1	1	1	0	0
11	Tube stranding lay over length	mm					
12	Qty. of Impregnated	Kg					
13	Outer Sheath Thickness(min)	mm					
14	Cable diameter	mm					
15	Cable weight	Kg/km					
16	Cable to be designed to Fibre strain value of.	%					

17	Cable to be tested at deoined load for oibre strain value of	%					

Note: The manufacturer shall submit the design calculations which shall be cross checked.

XVI. Pole & mast for UBR installation

Sr. No.	Parameters	Minimum Specifications
1.	Material of construction	Mild steel
2.	Other	Should be hot dip galvanized
3.	Wind survivability	~~Should withstand wind speed of minimum 150 Kmph in normal area and minimum 200 Kmph in coastal area~~ Pole & mast for UBR installation should withstand wind speed of minimum 150 Kmph in normal area and minimum 180 Kmph in coastal and Kutch area. Successful bidder has to ensure tower earthing, lightening arrestor, aviation lamps and other related components as per compliance requirement of DoT.
4.		Foundation should be constructed to support above mentioned wind speed Considering the safety of villagers/citizens,This will be applicable to all wireless inventroy installed infrastructure like pole, Tower,Mast,etc. excluding wall mount pole
5.		Foundation bolt, foundation plate, other accessories must be supplied to support above mentioned wind speed
6	For Wall Mount	With proper safety precautions (3mtr) minimum 2 C- Clamp support

XVII. Porta Cabin

Sr. no.	Parameters	Minimum Specifications
1	Internal dimensions	Length (Depth of shelter) –3 Meter, Width – 3 Meter, Height – 2.7 Meter
2	Thickness of Inner Wall skin	>=0.8 mm percolated GI sheet
3	Thickness of Outer Wall skin	>=0.6 mm percolated GI sheet
4	Core material between inner wall skin and outer wall skin	a. 100 mm thick PIR (Polyisocyanurate acid-modified polyurethane) /Poly Urethane Foam or equivalent
		b. Density of 40kg/Cu. m.
		c. Thermal conductivity: < 0.02 W/m. Degree Kelvin
5	Integral projected roof	100 mm on all four sides to give rain Protection
6	Floor Insulation	55 mm thick PUF
7	Floor load capacity	2000 kg/Square meter
8	Survival wind speed	~~At least 150 Kmph~~ minimum 150 Kmph in normal area and minimum 180 Kmph in coastal and Kutch area
9	Door	Insulated Metallic door, at least 920 mm X 2140 mm fitted with rubber gasket
10	Door Locks Standard	Concealed lock with sturdy handle and additional manual SS lock with minimum 4 sets of keys
11	Door Hinges	Stainless steel pickproof Hinges (3 Nos.)
12	Cable tray	a. 250 mm wide powder coated aluminum ladder type cable tray
		b. Thickness 2 mm
13	Others	Porta cabin shall be self-standing, self-supporting galvanized steel structure.
14		Porta cabin roof shall be cambered to the side of the porta cabin
15		Porta cabin shall be designed on heavy steel channel frame and secured using foundation bolts.
16		A 19 mm Cement fibre sheet Fire Proof shall rest on the porta cabin floor. It shall be fire retardant, fungus proof, termite proof and anti-abrasive.
17		Floor shall be covered with 1.8 to 2.2 mm thick Green, Blue or any other attractive color anti-static mat
18		For earthing of electronics & Electrical components, Two numbers of wall mount long copper strip/bar of dimensions length 300 mm, width 25mm, 5mm depth with M8 bolt size rounded holes and insulator in it.
19		Door rain guard to be provided above the door for smooth operations.
20		Porta cabin shall have cut-outs for following:
		· Fiber cable
		· Power cable
		· Air Condition inlet & outlet

Sr. no.	Parameters	Minimum Specifications
		· Earthing cable
		a) Fiber cable Cut-out will be made by bidder at each shelter location at spot marked by GFGNL.
		b) To avoid water seepage bidder will fix MCT module (Cable entry module) which can allow 9 fiber cable entry (from the side corner of the top as mentioned in diagram)(cable diameter may range between 25mm to 8 mm) at each shelter location this cut out will be dedicatedly for fibre cable. Puff ceiling required for both in and outside gap filling.
		c) Selected bidder will also have to do the Puff sealing on any open holes to avoid water seepage in to shelter.
21		Porta cabin shall be waterproof.
		a) At the time of acceptance testing through water showering or any other methodology as per facility available at site to ensure water proofing for all installed GFGNL shelters. Power supply needs to be shut before starting for this testing and all Equipments installed in shelter needs to be powered off.
22		Porta cabin shall have adjustable anti-corrosive Aluminum access ladder.
23		The foundation shall be made of reinforced cement concrete 12”x12” with 16 mm steel bars with suitable grade to sustain entire load of porta cabin and equipment.
24		The foundation shall be designed in accordance with local rules and regulations and the municipal / concerned government authorities’ guidelines to be adhered.
25		a) While constructing the foundation, load bearing capacity of soil, seismic load and wind load to be accounted for. In case of roof top installation, building load bearing capacity & structural stability to be accounted for.
		b) Bidder shall have to submit the soil testing / structure stability testing report/certificate for each infrastructure location before start of work from Govt. approved agency.
26		The foundation shall support the porta cabin at minimum 4 points with vertical RCC Columns having arrangement of base plate (Should be anti-corrosive) and foundation bolt to fix the porta cabin. The height of the RCC column should be atleast 90 cm as per site requirement to protect porta cabin from waterlogging
27		Steps required to be provided for entering to porta cabin/shelter.
28		Porta cabin shall have at least 2 no. x 20W white color LED tube light. The porta cabin shall have adequate lighting system and safety equipment.
29		Porta cabin shall have at least 1 no. DC operated emergency light
30		Porta cabin shall have wall mounted / floor mounted ACDB (AC distribution box) with suitable MCBs and visual indication for each phase of supply. All the MCB units shall bear ISI mark.
31		Porta cabin shall have at least 2 no. x 15A adjustable AC socket with switch board for laptop / tester charging.

Sr. no.	Parameters	Minimum Specifications
32		Porta cabin shall have sensors/transducers for temperature, door opening and smoke/fire detection. Necessary arrangement needs to be done to extend all these alarms to SMPS controller card so that same can be sent towards GFGNL NOC/NMS. Bidder shall have to provide the required modem/hardware to extend the connectivity.
33		Porta cabin shall be equipped with Fire extinguisher clean agent -1 nos. - 6Kg; and one (1) nos. auto actuator FM200 ISI marked
34		Porta cabin shall have acrylic based polymer coating to cover entire roof joints to provide rain shield on the porta cabin and the coating shall withstand UV rays and expansion / contraction under extreme weather condition. The construction of porta cabin will be such that water seepage must not happen in any condition.
35		Construction of porta cabin shall be such that it can be transported in a dismantled form to the site & assembled there
36	Signage	4 mm thick ACP / SS sign of any shape and size cut on CNC router cutting and smoothened at all corners and edges shall be provided. Matter shall be cut in 3M High intensity prismatic Reflective vinyl ASTM Type 4 and paste on it as per manufacturer's specifications. UV stabilized lamination shall be done on it. The signage shall be fixed with necessary SS studs, SS fasteners, self-adhesive tape of 3M, SS rod, SS chain, clamp on wall. Backing ACP sheet shall be fixed with SS Studs on the wall. Pasting of vinyl (in case of ACP) must be accurate without any kind of bubbles. Content of sign shall be letters (In Gujarati & English), graphics, signs, arrows, etc. in any colour as per the authority. The bidder should do the sampling and get it approved with the authority before execution. A separate Radium Strip (for night vision) for night visibility across all boarders of the Portable Cabin shelter must be fitted. This radium patti (Strip) should at least be 100mm vide with red or yellow color.
37	Lifting Hooks & Base Plates	To facilitate transportation. lifting & shifting necessary lifting hooks (minimum 4)for loading, unloading shall be provided. All the corner post shall have min. 16mm thick base plate of size 250mm X 250mm on both top and bottom

XVIII. SMPS Battery

#	Parameters	Minimum Specifications
1	Input Voltage and Frequency	300 - 475 VAC, Three Phase and 50 Hz +/- 2 Hz
2	Output Voltage	Nominal: - 48V DC
3	Cutoff voltage for Battery	SMPS should be able to configure for defining Cutoff voltage (V): -42v to -44v, Further, Referring to the TEC GR(TEC: 67030:2024) cutoff voltage : -42V to -47V However, it should be providing option of setting manually for cut-off range for critical sites
4	Rectifier module / Capacity	a) Adequate capacity to cater DC load of 60Amp for electronic equipments. Rectifier modules of min 80 Amp (N+1) / 4KW to be supplied. Bidder has to consider charging current requirement for battery back-up separately. Selected Bidder can provide minimum 2 nos. rectifier modules each having minimum 80 Amp capacity per each SMPS. Since TEC GR for

#	Parameters	Minimum Specifications
		80A is not available, 80A Rectifier with certified BIS ~~and~~ or type test module with STQC/SGS will be qualified.
		b) Power plant compatible with Li-Ion batteries having 5+ 5 years of battery life & has enough capacity to take care of load and battery at C/10 rate of charge.
5	Protection	The SMPS shall have an In-built Class C surge protection device. SMPS power plant to ensure prevent from Deep Discharge and battery under voltage.
6	Alarm extension	The SMPS shall have advanced intelligent controller with ethernet interface supporting SNMP based communication for integration with GFGNL NMS to monitor specified parameters/alarms like overvoltage, battery on load, under voltage, temperature, door opening, smoke/fire detection, mains or battery discharge, etc. SMPS will have to send all these alarms towards NOC/NMS of GFGNL. OEM will have to share MIB file for necessary integration with NMS. Note: All the alarm should be through SMPS controller including all utilities like overvoltage, battery on load, under voltage, temperature, door opening, mains or battery discharge, etc. and other like smoke/fire detection. GFGNL will provide only single RJ45(Electrical) interface for alarm extension in network.
7	Indications & Alarms	The SMPS shall have LEDs for status indications and visual display to show alarms for output over voltage, overload or any module failure
8	Additional rectifier modules capability	The system shall be expandable at rack level itself, using the basic modules of the same rating as per the additional equipment to be deployed in future. Selected Bidder will have to provide solution such that additional one 80 Amp/4KW rectifier module can be added in future.
9	DCDB	The system shall be provided with at least 12 Nos. of MCBs (6 nos. 16Amp MCB + 6 nos. 32Amp MCB). MCBs may be installed separately in DCDB box or as part of SMPS chassis. All the MCB units shall bear ISI mark.
10	Battery Backup	Minimum backup of 480 Minutes on initial full load
11	Battery Type	a) Li-Ion (600 AH) Battery minimum
		b) Functional Operating Temperature Range (Charge) 0°C to 45°C & Operating temperature range (Discharge) 0 to 50°C, c) Proposed battery must have minimum 10 years of battery life and on site free of cost replacement warranty support for the contract tenure. Bidder will have to submit the undertaking along with test certificate confirming the life of proposed battery on its letter head duly signed and stamped by its competent authority. In case of degradation of battery performance during contract tenure, it will be in successful bidder's scope to replace the battery without any additional cost to GFGNL (i.e. batteries with lessor life is also qualified subjected to multiple replacements to meet the RFP requirement of 10 years of life, without any additional cost to GFGNL). Bidder will have to mention the no. of replacements considered in quoted bid during the contract period of 10 years. In the Past Gujarat has not seen any major power outage. Further, maintaining required cooling is also in the scope of bidder, so bidder and OEM needs to submit joint undertaking for meeting RFP requirement. d) Module charging voltage: Between -48V to -56V

#	Parameters	Minimum Specifications
12	Expected Battery life (EoL)	a) Under ideal conditions i.e. moderate ambient temperature (10°C to 35°C). However, the same battery at an average temperature of 35°C in cyclic discharge application to 80% DOD (depth of discharge) will have to give min. **ten(10)** years of operational life b) Bidder has to supply and provide warranty (5 years warranty and additional 2 years extended onsite replacement warranty) through OEM. c) Minimum 8 Hrs (480 mins on initial full load) Backup must be required , it is utmost important for the PIA to provide right battery having longer battery hours and tenure i.e., to meet minimum 8 hours during contract duration. d) The tolerance factor of degradation is 1 hour. Any excess degradation or shortfall in tenure is the bidder's risk and bidder have to replace the battery free of cost to GFGNL within 15 calendar days. In any circumstances, GFGNL will not bear battery replacement cost if battery performance degrades e) The replaced with valid proof of replacement of battery with same make or other compatible or higher make with submission of valid compliance certificate will be acceptable. f) The specification/s must be similar or higher prevailing at that time of replacement with submission till entire contract duration with warranty certificate and support from the date of successful field acceptance test. b) Depth of Discharge (DOD) is defined as the ratio of quantity of electricity (in Ampere-hour) removed from a cell or battery on discharge to its rated capacity.
13	Installation	a) Battery Bank, SMPS should be installed on a Non-corrosive stand/ or installed in separate Rack, stand/rack should be capable to withstand the load of SMPS and Battery bank. b) Battery stacking shall be done with a view to optimize floor space as per floor diagram and loading. The Contractor shall provide the necessary installation arrangements including grouting, base frames etc. c) Bidder will have to install the rack /stand & commission the SMPS & battery bank such that minimum space is occupied in telecom shelter d) However, Supply, Installation and commissioning, O&M of FDMS & OLT equipments will not be in the scope of Bidder
14	Other	SMPS with minimum 16KW capacity Battery Management System(BMS) with Li-ion battery, BMS to monitor the performance parameters of the utility and alarms and control the charging current of battery with all latest features
15	Compliance	Li-ion Battery should be allowed within compliance to latest valid TSEC GR 67030:2024
16	Battery Cabinet	It is preferable to provide this advised solution, i.e. batteries in housed with same rack of cabinet of SMPS . However, if anyone

#	Parameters	Minimum Specifications
		does not have this provision then it is deemed optional for wider participation. This(single rack) solution will be rated qualitative high marks in comparison with two different/separate facilities/racks. Bidder, those who does not have this solution should ensure to stack both the rack(i.e., battery bank and SMPS one another above with proper safety if separate solution) in the way to occupy single rack space and avoid space challenges

Note:

Bidder has to supply and provide warranty (5 years warranty and additional 2 years extended onsite replacement warranty) through OEM. Bidder will be solely responsible to replace the battery bank at the end of 7 years for the cases which are not replaced during 7 (5+2) years warranty period.

XIX. Air Conditioning

#	Particular	Minimum Specification
1	Total Cooling capacity	Min 2TR twin Circuit without FCU, Commercial Grade ACs.
2	Rated Voltage	230V Single phase – 50Hz,
3	Refringent used	R32
4	Timer facility	Yes
5	Display panel	Yes

#	Particular	Minimum Specification
6	Mat. Type of Tube	Internally grooved Copper
7	Evaporate Air flow	Minimum 600 CFM
8	General	1. There shall be two A/Cs of equal Tr capacity at each infrastructure site. Whole unit/cabinet shall be outside the shelter/room with the requirement of at the most two cutouts in the shelter/room wall; one for supply-air & the other for return-air.
		2. Weight of the unit has to be supported on a galvanized steel stand, of requisite height as per the site condition, designed to carry the static & dynamic load of the unit continuously. The stand shall be properly grouted at site. The A/C unit shall be powder coated with 50micron thick layer
9	Supply, installation commissioning of AC	1. The unit in itself shall be weatherproof so as to safeguard the components inside.
		2. The evaporator filter shall be of washable (using water) type.
		3. Built-in thermal overload shall be provided in each A/C.
		4. Opening in which the A/C is installed should be sealed to prevent air-leakage.
		5. A/C units should be ruggedly fixed to ensure minimum vibration during operation.
		6. Manufacturer's written-down procedure should be strictly adhered to regarding vacuuming, buffering & gas charging.
		7. Interiors of the A/C equipment must be cleaned before switching it ON. Else the accumulated dust inside the A/C will spread in the room.
		8. Check the tightness of all electrical terminations before switching ON the A/C.
		9. There should be no loose nut-bolt/screw/joint in the A/C.
		10. During testing of both the A/Cs, simulate all the alarms. We should get all the alarms on the controller in auto & manual modes.
		11. Potential free contacts shall be provided to transmit each alarm. 10m of alarm-cable shall be provided and the same shall be extended to "alarm extension terminal block" within the shelter.

#	Particular	Minimum Specification
		12. Required electrical cabling including cabling from the nearest available electrical socket, MCB installation, piping supply & fixing of drainpipe etc. as per requirement. If manufacturer is not providing any free material along with machine, then agency will have to supply the same to successfully comply to the scope of work of this RFP. Electrical cable must be joint free and continuous.)
10	Controller requirement	1. Microprocessor type with ability of measuring ambient and shelter temperature and humidity and display through LED and alarm output.(Either External or inbuilt humidity sensor with display and alarm is required.)
		2. Facility to operate the A/Cs in either Auto or manual mode shall be provided. Changeover from auto to manual mode & vice-versa shall be simultaneous for both A/Cs.
		1. Temperature to be maintained inside the shelter/room shall be settable from 22°C to 30°C 2. ACs should work even at 50 °C outside temperature
		3. In any mode (auto or manual), temperature in the shelter/room shall not vary more than +/-2°C from the set value.
		4. Only one A/C shall operate at any point of time; And the cycling of A/Cs shall happen every 6 hrs.
		5. I/P power available will be 1f, 230V +/-10% AC, 47.5-51.5Hz.
11	Certification/Rating	IS 1391

Warranty of Air conditioner:

1. Bidder shall have to provide 5 years + 5 years(EoL) extended onsite warranty of compressor unit including controller and whole air-conditioner unit against manufacturing defect and 1-year onsite replacement warranty of whole unit. Warranty will start after successful completion of FAT of unit at site.
2. User Manuals: Simple user-friendly operating guidance should be provided by PIA through OEM.

XX. Split air conditioner indoor

#	Particular	Specification for 2 Ton
1	Cooling capacity	2 Ton
2	Dehumidification	Yes
3	Remote control	Yes
4	Timer facility	Yes

5	Display panel	Yes
6	Condenser coil of main unit & outdoor unit	Copper
7	Certification/Rating	IS 1391 & Minimum 4 star
8	Refringent used	R32

Note:

1. GFGNL may ask bidder to install AC unit in pair with controller or may ask for single unit installation as per site requirement on 15% of the sites of total scope mentioned in this RFP where in indoor space will be allotted in building premises.
2. BEE Star rating (should be 4 star and above) will be applicable for split AC and PAC.
3. The successful bidder should emboss stickers of GFGNL /purchase order number on the material supplied & installed.
4. Product catalogue for the model quoted is to be attached with the sealed quotation.
5. GFGNL may ask bidder to install AC unit in pair with controller or may ask for single unit installation as per site requirement along with required electrical cabling till existing controller unit.
6. Controlling module with display and auto switch over facility should be installed by Bidder on location provided by GFGNL. Controller will display the room temperature and will allow to adjust the cut of time between Air conditioner units. Initial setting will be done for AC switchover once every six (6) hours.
7. Installation and commissioning of AC units (including drilling, outdoor stand installation for outdoor unit, installation of indoor & outdoor units along with controller, white cementing, required electrical cabling including cabling from the nearest available electrical socket, MCB installation (of 25 Amp), copper piping supply & fixing of drain pipe etc. as per requirement. If manufacturer is not providing any free material along with machine, then agency will have to supply the same to successfully comply to the scope of work of this RFP. Electrical cable must be joint free and continuous.)
8. The Bidder should have required tools for AC installation and shall be responsible for making power socket arrangements, MCB installation etc. Electrical cable must be joint free and continuous.

a) The Bidder shall have to resurface and restore the civil works in case of any damage done during the execution of work at exchange.

XXI. 3-Phase Servo Stabilizer

Specification	Sub-Spec	Value
GENERIC	Conformation of servo motor operated LVC to	IS:9815 (Pt-1) for ~~single~~ three phase
	KVA rating (KVA)	No of Phase: Three, Rated KVA: 3 x16
	BIS Marked	Yes
	CM/L No (BIS Marked if Yes must declare CM/L Number IF No Write NA)	IS 9815-1
	Warranty (Years)	5 Years + 5 Years
CONSTRUCTIONAL	Number of phases on output	Three (3 single phase connected in star)
	Input voltage range per phase (Volt)	110-300
	Output (Volt) (+/- 1%)	415 volt
	Type of cooling	Air cooled
	Quantity of oil (Litres)	NA
	Transformer (s) winding material	Copper
FUNCTIONAL	Efficiency at rated output (%)	>/= 95%
	Power factor	>/=0.95
	Continuous duty	Yes
	No load loss at minimum rated input (Watt), and maximum rated input voltage (Watt) shall conform to IS:9815 latest:	Yes
	Full load loss at minimum rated input and at maximum rated input voltage (Watt) shall conform to IS:9815 latest:	Yes
CERTIFICATIONS	Availability of Type test report from Central government/NABL/ILAC accredited laboratory to prove conformity to the specification	Yes
	Test Report No	Required

Specification	Sub-Spec	Value
	Test Report date	Required
	Name of Lab	Required
	Address of Lab	Required

XXII.1-Single Phase Servo Stabilizer

Specification	Sub-Spec	Value
GENERIC	Conformation of servo motor operated LVC to	IS:9815 (Pt-1) for single phase
	KVA rating (KVA)	No of Phase: Single, Rated KVA:10
	BIS Marked	Yes
	CM/L No (BIS Marked if Yes must declare CM/L Number IF No Write NA)	IS 9815-1
	Warranty (Years)	5 Years + 5 Years
CONSTRUCTIONAL	Number of phases on output	Single
	Input voltage range per phase (Volt)	110-300
	Output (Volt) (+/- 1%)	240 Volt
	Type of cooling	Air cooled
	Quantity of oil (Litres)	NA
	Transformer (s) winding material	Copper
FUNCTIONAL	Efficiency at rated output (%)	>/= 95%
	Power factor	>/=0.95
	Continuous duty	Yes
	No load loss at minimum rated input (Watt), and maximum rated input voltage (Watt) shall conform to IS:9815 latest:	Yes
	Full load loss at minimum rated input and at maximum rated input voltage (Watt) shall conform to IS:9815 latest:	Yes
CERTIFICATIONS	Availability of Type test report from Central government/NABL/ILAC accredited laboratory to prove conformity to the specification	Yes

Specification	Sub-Spec	Value
	Test Report No	Required
	Test Report date	Required
	Name of Lab	Required
	Address of Lab	Required

XXIII. Manual -Change Over Switch Specification

Sr. No	Particular	Description
1.	Application	Electric transfer Switch that switches load between Mains and Generator and limit current at Generator end
2.	Changer Type	Automatic Change Over
3.	Features	1) Microcontroller based circuit for the faster and better response. 2) Operational status indication. 3) Reset Provision 4) Mode Selection Feature
4.	Main Current Voltage	40A & 415V
5.	Gen Current and Voltage	6-40A & 230V (P-N) & 6-40A & 415V (P-N)
6.	Frequency	50Hz
7.	Duty	Continuous
8.	Conditional Short Circuit	5kA
9.	Electrical Life	20000 ops or better
10.	Protection	IP-20
11.	Operating Temperature	up to 55 degree C
12.	Mounting	Wall Mounting/Surface Standing (As per site requirements)
13.	Enclosure Protection	IP-52 (CRCA)
14.	Standard Conformity	IEC 60947-6
15.	Warranty	5 Yr. OEM warranty

XXIV. Fencing

Sr. No.	Particular	Minimum Specification
1	Fence Fabric	Mesh Size 50 x 50mm
		Dia of mesh wire 2mm
		Both ends Knuckled including three-line wires(at top, center and bottom)
		ISI marked,IS:2721/2003
2	Length fabric roll	15.00 mtr
3	Chain link fence	Fixed with angle iron with the help of 3xMS round bar 10mm dia one each at top,middle and bottom of the mesh fabric.
4	Nut and bolts	Diameter : 5 Nos x 60mm long with 12mm
		Along with 2(two) numbers of 3 mm steel washers at equal interval from ground level to “Y” neck of each angle

Sr. No.	Particular	Minimum Specification
		(reference diagram below)

XXV. Main Gate

Sr. No	Description	
1	Door Type	Double Door
2	Frame Material	(50 50 mm iron post)
3	Filling	mesh of iron bar having thickness 3 mm
4	Minimum weight	35 kg
5	Paint	Two coats of synthetic enamel paint over a coat of corrosion resistant coating of red oxide.
6	Locking arrangement	Both side (inner / outer)
7	Covering	Iron plat (minimum 2 mm) covering up to 1 ft from ground level and Top
8	Branding	GFGNL Logo on top of the gate (both side)
		(Position Indicated in blue circle in below sketch for reference)
9	Height	1830 mm
10	Width	1830 mm

XXVI. Fire Suppression System- Clean Agent

Sr. No.	Parameters	Type
1	Extinguishing Agent	Clean Agent, C3F7H or equivalent chemical which will not harmful to active network elements performance.
2	Capacity(in Kg)	Atleast 5 Kg or above
3	Can Construction	Mid Steel
4	Automatic Activation Temperature	Auto activate on or above 65^0C
5	Diameter(in mm)	Not more then 250mm
6	Test Pressure(in Kg/Sq. cm)	35
7	Super Charge Pressure(in Kg/Sq. cm)	<=15
8	Discharge Time(In seconds)	<= 10 sec
9	Mounting	Ceiling Mounting type
10	Type	Modular, self-pressuring, automatic operation(auto actuator)
11	Gross weight	Up to 8 Kg.
12	Area Coverage	Minimum 4 Sq.m

XXVII. Security ***Fence with Chain Link Fence & Concertina Coil***

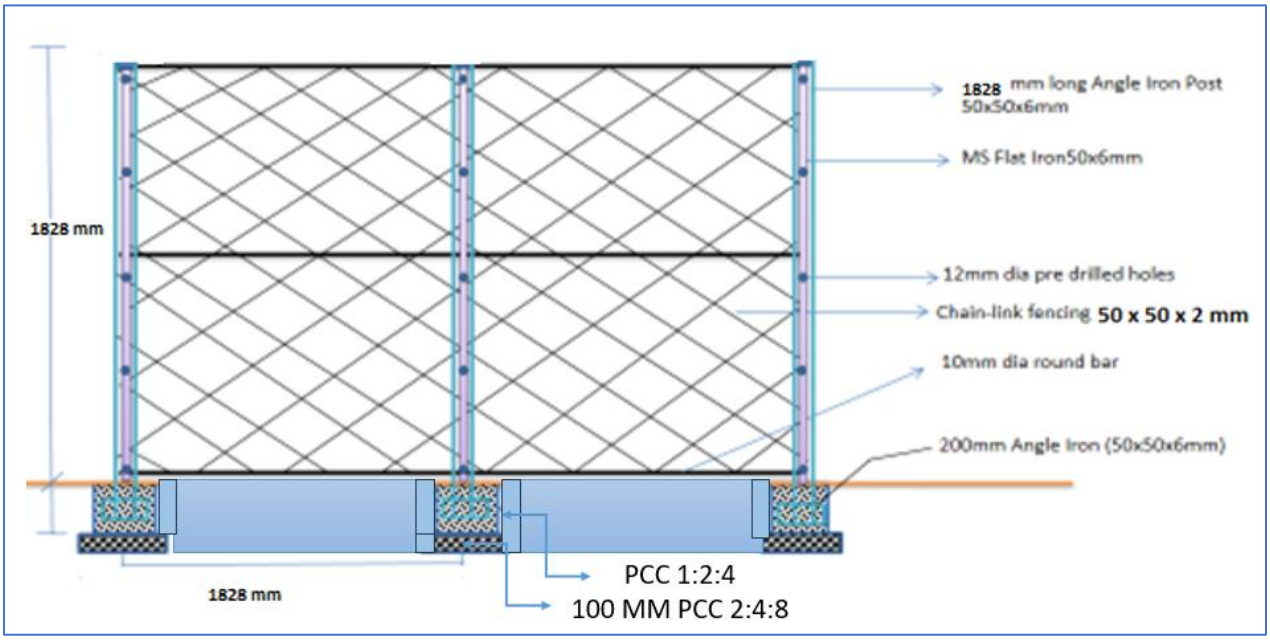
Specification:

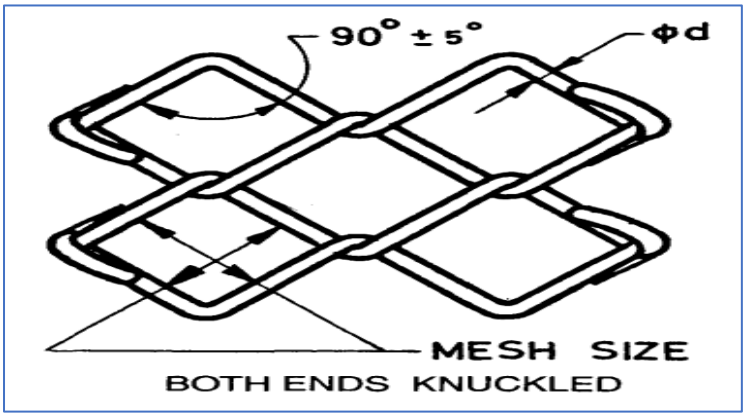
Heavy galvanized quality Chain link fence fabric (Mesh Size 50x50mm and dia of mesh wire 2 mm).Heavy galvanized quality chain link fence fabric both ends knuckled including three-line wires (at top, center and bottom) ISI marked, conforming to IS: 2721/2003, as per following specifications: Chain link mesh size shall be made from standard 50 x 50mm + 5mm,Nominal dia of mesh wire 2 mm. Width of mesh 2.50m. Both ends of fabric knuckled in a roll. Length of fabric in a roll 15.00mtr. Chain link fence shall be fixed with angle iron with the help of 3xMS round bar 10mm dia one each at top, middle and bottom of the mesh fabric. 5 Nos x 60mm long 12mm dia nut and bolts along with two Nos of 3mm steel washers at equal interval from ground level to 'Ý' neck of each angle as shown in Sketch. Bidder has to ensure proper anti rust paint coating to security fence with all other accessories to suffice the long term requirements.

Description	Details of Specifications
Fence Fabric	Mesh Size 50 x 50mm Dia of mesh wire 2mm Both ends Knuckled including three-line wires (at top, center and bottom) ISI marked,IS:2721/2003
Length fabric roll	15.00 mtr
Chain link fence	Fixed with angle iron with the help of 3xMS round bar 10mm dia one each at top, middle and bottom of the mesh fabric.
Nut and bolts	Diameter: 5 Nos x 60mm long with 12mm Along with 2(two) numbers of 3 mm steel washers at equal interval from ground level to “Y” neck of each angle (reference diagram below)

Table:0A Security Fence with Chain Link Fence & Concertina Coil

Illustrative diagram:





Drawing:04 Security Fence with Chain Link Fence & Concertina Coil

I. Construction Material

Ordinary Portland Cement grade 43, IS-12269-1990, packed in 50 Kgs HDPE bags conforming to ISI 1652/2000.

Coarse Sand

Sand shall be clean, sharp, angular hard and durable free from adherent coating and shall not contain clay, mica, and other impurities. The maximum quantities of clay and fine silt in sand shall not be more than 5% by mass as per IS-383-1970.

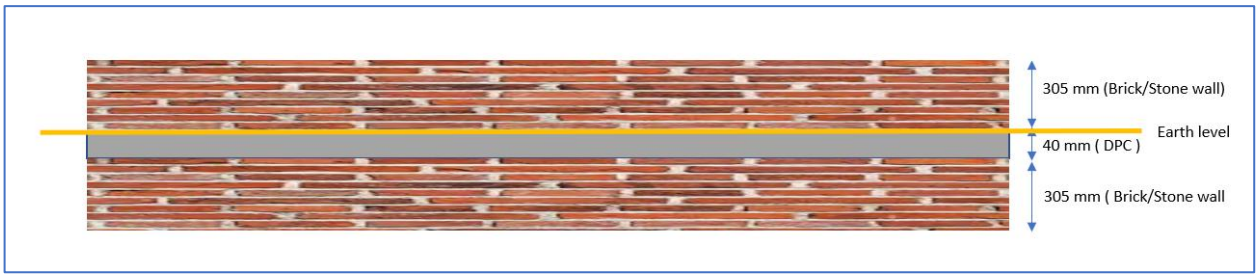
20mm Stone Aggregates: Stone aggregate shall be crushed stone 20mm graded conforming to IS-383 -1970 and shall be clean hard tough, durable and of uniform quality throughout. The aggregate shall be free from soft disintegrated materials, vegetable, and other organic impurities.

40mm Stone Aggregates: Stone aggregate shall be crushed stone 40mm graded conforming to IS-383 -1970 and shall be clean hard tough, durable and of uniform quality throughout. The aggregate shall be free from soft disintegrated materials, vegetable, and other organic impurities.

Brick/ Stonework: Grade -1 As per requirement**.**

The ratios of cement to sand in brick/stone masonry shall be used as 1: 5. The ratios of cement to sand in reinforced concrete shall be used as 1: 1.5. The ratios of cement to sand in plastering work shall be used as 1: 5.

The thickness of the plaster shall not be less than 12 mm. The thickness of the wall shall not be less than 9" (including plaster)



Drawing:05 Construction Material

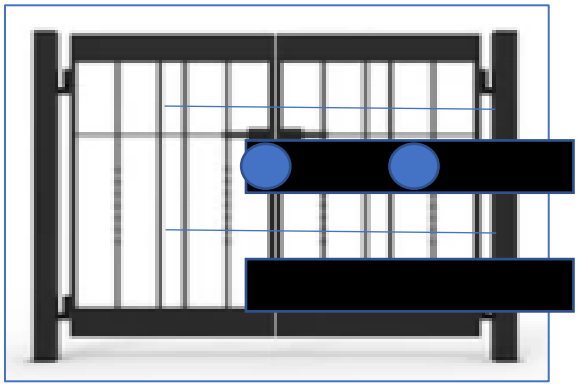
Note: Fencing should be in the boundary of the allocated places for shelter with confirmation from local authority and GFGNL authorized official.

XXVIII. Main Gate (Indicative design)

Sr. No	Description	
1.	Door Type	Double Door
2.	Frame Material	(50 50 mm iron post)
3.	Filling	mesh of iron bar having thickness 3 mm
4.	Minimum weight	35 kg
5.	Paint	Two coats of synthetic enamel paint over a coat of corrosion resistant coating of red oxide.
6.	Locking arrangement	Both side (inner / outer)
7.	Covering	Iron plat (minimum 2 mm) covering up to 1 ft from ground level and Top
8.	Branding	GFGNL Logo on top of the gate (both side) (Position Indicated in blue circle in below sketch for reference)
9.	Height	1830 mm (6 Ft)
10.	Width	1830 mm (6 Ft)
11.	Other	Standard Outdoor grade lock with 4 keys, durable, corrosion resistant materials (eg. Stainless Steel), protected from Cutting and sawing. The space between the horizontal and vertical bars in the gate shall not exceed 100 mm center-to-center to prevent unauthorized entry.

Table:0B Main Gate Specification

Note: Bidder must take design approval from GFGNL before starting of fabrication work



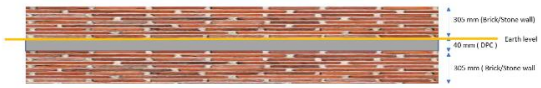
Drawing:06 Main Gate

XXIX. FM200 Fire Suppression System-Clean Agent

a. FM-200 is a fast-acting clean agent comprised of heptafluoropropane, which is a compound of carbon, fluorine and hydrogen. This agent is a part of a total flood system and reaches extinguishing levels in 10 seconds or less, which translates near to zero damage, reduction of safety risk to occupants, and less downtime.
b. SITC of Clean gas agent FM 200 as per NFPA 2001-2015 in UL listed and PESO Approved Cylinders of suitable capacity for LTR-G (Gallon to Ltr) Facilities. Clean gas shall be filled in UL listed filling station as per approved design calculations.
c. The cylinder bank shall be fitted with all UL/VDS/FM/LPCB Listed & Marked listed accessories viz., valve assembly, arrangement for supervisory switch connection for monitoring cylinder pressure, a pressure gauge with a safety burst disc, electronic control head/ Solenoid, pressure operated control head, flexible hose, strap, Non return valve (NRV) and a safety cap from same OEM and as per enclosed specifications.

The detailed design to be submitted by the supplier for approval.

XXX. Existing Shelter Infrastructure Details

Sr. No	Description	Dimensions	Status in Existing Shelter
1.	Shelter Size	3 x 3 meter	i) ~ 410 existing shelter already available , ii) ~280 + new shelter need to install
2.	Foundation and DPC work	**Foundation work:**  DPC level shall be minimum 1 ft. The DPC should be of 40 mm thickness and should be of uniform thickness. DPC is made up of cement concrete of mix 1:2:4 (1-cement: 2-coarse sand: 4-12.5mm stone aggregate) For brick work please refer, point no. 4 of this table.	New Requirement
3.	Fencing Type-1	Angle iron post (50 x50 x 6 mm) and mesh wire height 5 ft. Min Length* 70 ft Wire thickness 2 mm Material: Angle Iron Post with two coats of synthetic enamel paint over a coat of corrosion resistant coating of red oxide. **Note:** length may vary However, Payment will be made on actual basis.	New Requirement
4.	Fencing Type-2 Boundary wall (Brick/ Stonework) 5 ft. from DPC level.	**Construction Material** Ordinary Portland Cement grade 43, IS-12269-1990, packed in 50 Kgs HDPE bags conforming to ISI 1652/2000. **Coarse Sand** Sand shall be clean, sharp, angular hard and durable free from adherent coating and shall not contain clay, mica, and other impurities. The maximum quantities of clay and fine silt in sand shall not be more than 5% by mass as per IS-383-1970. **20mm Stone Aggregates**: Stone aggregate shall be crushed stone 20mm graded conforming to IS-383 -1970 and shall be clean hard tough, durable and of uniform quality throughout. The aggregate shall be free from soft disintegrated materials, vegetable, and other organic impurities. **40mm Stone Aggregates**: Stone aggregate shall be crushed stone 40mm graded conforming to IS-383 -1970 and shall be clean hard tough, durable and of uniform quality throughout. The aggregate	New Requirement at exceptional cases

Sr. No	Description	Dimensions	Status in Existing Shelter
		shall be free from soft disintegrated materials, vegetable, and other organic impurities. **Brick/ Stonework:** Grade -1 As per requirement or a**s per CPWD guidelines** The ratios of cement to sand in brick/stone masonry shall be used as 1: 5. The ratios of cement to sand in reinforced concrete shall be used as 1: 1.5. The ratios of cement to sand in plastering work shall be used as 1: 5. The thickness of the plaster shall not be less than 12 mm. The thickness of the wall shall not be less than 10" (including plaster)	
5.	Main Gate for Shelter premises	Specifications as mentioned above	New Requirement
6.	Pathway from Main Gate to Shelter	3 ft. X 5 ft. (Approx) Note: minimum 4" thickness of RCC (M15 , M10) for pathway and dimension may vary based on actual site condition However, Payment will be made on actual basis	New Requirement
8.	SITC of Change over Switch	1 for each shelter	New Requirement
9.	FM200-Fire Suppression System/Clean Agent(5Kg)	1 for each shelter	New Requirement
10.	Servo Stabilizer	1 for each shelter	Available in existing Shelter
12.	Aluminum Ladder	1 for each shelter	Available in existing Shelter
13.	Fire Extinguisher	1 for each shelter	Available in existing Shelter
14.	Smoke Detector	2 for each shelter	Available in existing Shelter
15.	Emergency Light	1 for each shelter	Available in existing Shelter
16.	Cable Tray	As per illustrative diagram + Outdoor cable tray is installed for routing of OFC cables entering in Roxtec.	Available in existing Shelter
17.	2TR Twin circuit Air Conditioner without FCU	At each Shelter	Available at existing Shelter
18.	Split Air Conditioner(4Star)	At each TC/DC or as per GFGNL decided location/s	Available at Phase-II sites.

Sr. No	Description	Dimensions	Status in Existing Shelter
19.	SMPS	1 for each shelter	Available in existing Shelter
20.	Battery Bank	600AH for VRLA Batteries	Available in existing Shelter
21.	Rectifier Modules	Capacity: 50 Amp (3 Qty) / 80 Amp (2 Qty)	Available in existing Shelter
23.	Battery Bank	600AH of Li Batteries	Required at New Shelter
24.	ELCB	1 for each Shelter	Available in existing Shelter
25.	Manual Change Over Switch * It is the core responsibility of the agency to assess and select the sites and install change over switch to maintain the SLA in coordination with GFGNL official.	1 for each Shelter	New Requirement

Table:0D Activity Detail

Above requirements are indicative, selected bidder will be solely responsible to upgrade the existing shelter infrastructure as well develop the new shelter infrastructure by comprising all above inventories. Also, the bidder will have to ensure the after successful deliverable and completion of the FAT.

XXXI. Geographical *Information System (GIS):*

Sr. No	Category	Requirement
1	Deployment	• The solution must be a GIS-based web and native mobile application (Android 13.0+ and iOS 15+). All modules must include web and mobile apps except for the Fiber Planning tool, which is web-based only.

Sr. No	Category	Requirement
		• The application must support deployment on-premises or in a secure cloud (public/private) environment accessible by users. • Support operation across disparate offices with centralized data storage and database updates synchronized without requiring high- speed network links. • Use open-source databases like PostgreSQL. • Allow importing network data in various formats (Excel, ESRI Shape file SHP, DXF, CSV, Google KML/KMZ, MapInfo Tab). • Enable exporting network data in formats like ESRI Shape file SHP, DXF, XML, CSV, PDF, Google KML/KMZ, MapInfo Tab.
2	PM Tool	• The project monitoring tool shall enable real-time tracking of project progress, (timelines and milestones- e.g HOTO, Survey, new fiber construction etc.) including the status of network infrastructure deployment, equipment installation, and connectivity establishment across all packages of Amended BharatNet program. • The PIA of GFGNL ABP RFP shall provide the input for managing project documents, drawings, specifications, permits, contracts, and other relevant documentation etc. • The PIA of GFGNL ABP RFP shall provide all required information for the application dashboard in standard/ defined format such as measurement book, acceptance test proofs etc. The details shall be, but not restricted to, as under: - • Block/GP wise Cable Length. • Block /GP wise Duct length. • Block /GP wise Trench Length. • Total as build OSP network elements count/details of FDMS/ Hand hole/ Manhole/ Site/ Splice Closure etc. • Total Planned OSP network elements count/details of FDMS/ Hand hole/ Manhole/ Router/ Site/Splice Closure etc. • Total ISP network Elements count/details of Router/ Switch/OLT /Repeater /Equipment's etc. • The PIA of GFGNL ABP RFP shall be responsible to update the project progress in the project monitoring tool, enabling the system to automatically create milestone-based proforma invoices.
3	API Integration	• Provide REST/SOAP/XML-based integration with OSS, BSS, ERP, and Fiber Management applications.

Sr. No	Category	Requirement
		• Modules must support integration with ticketing systems, RFMS for fault locations, NMS/OSS for ISP updates, and GIS-based inventory systems. • Enable integration with SMS, email, and WhatsApp gateways for communication with field technicians/customers.
4	User Management	• The solution shall support single sign-on or authenticate via Active Directory where database is to be provided by PIA of PH-III and implementation to be done by bidder. • The solution must support a 2-way authentication mechanism to access the application by authorized users. • Administrators should be able to create, edit, and delete users, groups, and roles. Users should be assigned roles with varying privileges. • Administrators should be able to assign users to specific modules • The system should enable the creation, editing, and deletion of network entities based on user permissions. • Implement area-based rights, restricting users to view or edit data within their assigned districts/states/blocks/regions. • Support the creation of groups/teams, user log monitoring, and visibility of active users in various groups and roles. • Administrators should be able to restrict users to their locations. Geofencing support is required based on multiple segments such as country, region, and province. • The solution must manage thousands of named users seamlessly. • Support multiple levels of hierarchy and approval mechanisms for created or updated data. • Allow administrators to manage both internal and external users of GFGNL. • Provide specific module access to PIAs along with specific circles, enabling them to manage users as per the defined rules.
5	Base Map & Mapping Platform	• The solution must bundle GIS layers for block boundaries, GP, and village locations. Additional necessary layers for network planning should also be provided. • Users should be able to query block boundaries, GPs, or villages in a district/state. • The solution should use a cloud-hosted map platform like Google Maps, supporting high-resolution satellite imagery, terrain view, and Streetview (where available). • The base map should include predefined yet customizable administrative features such as boundaries, street centerlines, railways, and waterways.

Sr. No	Category	Requirement
		• Support user-configurable layers for custom land base management. • Load/display vector/raster maps, network, and customer data for a given location without relying on Web Mapping Service (WMS). • Support adding and displaying third-party WMS layers. • Ensure consistency in map appearance and symbols across all web and mobile applications. • Administrators should be able to choose attributes of network entities as labels to display over the base map. • Include a Layer Manager functionality for toggling the visibility of layers. • Provide tools to measure distances between points. • Allow users to search for locations, places, and network elements on the map. • Enable advanced filtering to display network data on the map. • Support external map data views (e.g., KML/KMZ, SHP, TAB formats) without adding data to the database. • Provide advanced filtering for project and vendor codes to differentiate and visualize network data on the map. • Allow probing information shown on the base map at multiple zoom scales for detailed insights.
6	Configuration Capabilities	• Administrators should be able to attach forms or checklists, setting mandatory fields as part of the workflow or network process. • Enable adding custom-defined network equipment vendors and specifications, which can be mapped across all inventory entities. • Equipment modeling must be independent of network type or vendor, supporting multi-technology models such as FTTx, GPON/xGPON, xDSL, OTDR, WDM, etc. • All network element data models should use template-based modeling for configurable design specifications. • Assign unique names/IDs to network elements following admin-defined naming rules, with the ability to generate labeled outputs displayed on the map. • Provide an interface for admins to set threshold values for raising alerts on cable and equipment utilization. • Maintain personalized user workspaces to allow users to return to the same working area after session logout.
7	Fiber Inventory Management	• Support desktop planning with fiber network design topology, including ring-based and linear-based structures with shortest route determination.

Sr. No	Category	Requirement
		• Enable manual and automated creation of child rings if the planned ring exceeds permissible fiber length. • Provide options for various cable configurations (e.g., 24F, 48F, 96F, 144F) and infrastructure elements like ducts, trenches, poles, and routers. • Facilitate connectivity and splicing between cables, equipment, and components at block and GP levels. • Support standard loss configurations for multiple wavelengths (1310 nm, 1550 nm) and optical power loss calculations for endpoints like Gram Panchayats. • Incorporate restricted area planning, allowing users to designate restricted zones on the GIS base map and propose alternative network plans. • Enable planning for both Inside Plant (ISP) and Outside Plant (OSP) networks with integrated geolocation data. • Provide comprehensive land base datasets, including state, district, block boundaries, road networks, and population data for planning purposes. • Support exporting network plans in KML, Shape, and PDF formats with street view features. • Generate detailed reports such as BOM/BOQ, capacity utilization, optical link budgets, and tracing reports in graphical and tabular formats.
8	OSP & ISP Inventory	• Support design and management of fiber networks, including Backbone, Last mile. • Allow placement of infrastructure elements such as ducts, cables, chambers, poles, splices, routers, and ONTs. • Provide tools for civil structure placement (e.g., poles, manholes, ducts) using standard editing tools. • Support various network methodologies, including underground, overhead, and wall-clamped approaches. • Represent Passive and Active elements spatially and attribute-wise, including depth, height, and rack location. • Provide intuitive GUI representation of OSP and ISP components, enabling telecom planning, building, and operation across multi-vendor and multi-technology environments. • Include a “clone” function for creating new network elements based on existing templates. • Allow bulk import of network elements in formats such as KML, CSV, and Excel, using predefined templates. • Display the construction status of network elements (e.g., in-service, planned, dormant) in the layer manager. • Store audit logs of user updates with username and timestamp.

Sr. No	Category	Requirement
		• Support map and non-map editing functions (e.g., move, delete, change attributes) while ensuring data integrity. • Include an approval process for field changes via mobile application. • Manage network stages (planned, as-built, dormant) with bulk transition capabilities. • Visualize fiber states (connected, free, dark, reserved) and manage fiber cores in cables. • Create multiple plans and tag entities with unique project codes for tracking. • Support Inside Plant (ISP) views, including management of rooms, racks, and rack dimensions. • Automatically create network equipment inside racks based on input from NMS/EMS systems via APIs. • Provide graphical views of buildings, floors, risers, and cable connections, including vertical and grounding plans.
9	Optical Power & Loss Calculation	• Enable optical power link budget calculations between reference points, considering user-configurable loss values. • Manage standard attenuation values for splicing, patching, fiber loss, equipment loss, and connector loss at various wavelengths. • Fetch real-time loss details from NMS/EMS systems for cables and equipment via API integrations.
10	Network Modelling & View	• Provide a Network Entity Library with built-in data models for elements like sites, equipment, ducts, cables, manholes, splice closures, and poles. • Offer schematic views of network nodes, such as cables and splice closures, to display connected and free ports. • Allow users to edit locations and attributes of network elements and attach images/documents to any entity. • Manage historical changes on network entities, including attribute and geometrical modifications, with date/time stamping and modifier information. • Provide graphical and map-based views of end-to-end connectivity across multiple transport mediums. • Manage physical circuits end-to-end, tracing fiber connections from any point bidirectional on the map. • Enable splicing and patching functionalities for cables and equipment, offering traceability of connections upstream and downstream. • Provide splice and patch records (e.g., diagrams, charts) in textual and graphical formats, downloadable as PDFs or Excel files.

Sr. No	Category	Requirement
		• Generate shortest paths and alternative routes using road network data, incorporating fiber cut locations from OTDR/Remote Monitoring systems. • Allow optical length input from OTDR devices to determine and plot precise fault locations on the map.
11	Logical View	• Support logical views of equipment at the port level, displaying service information in a single diagram. • Enable service mapping for user-configurable services or services received from NMS/EMS systems, displaying service paths along physical network routes.
12	Automation & Monitoring	• Support bulk updates of network element attributes, like construction stage and location, using CSV templates. • Include an Auto Planning feature for Point-to-Point Backbone Fiber Planning with optimized route generation and BOM/BOQ creation. • Automatically place manholes, hand holes, or poles at equal intervals along planned cable routes. • Monitor the passive utilization of network elements like cables and equipment, triggering auto-notifications/alarms for over utilized components. • Fetch real-time utilization details of active equipment from NMS/EMS systems via APIs, displaying over utilized nodes on the GIS map.
13	Reports	• Generate capacity utilization reports for various network elements. • Provide schematic analysis reports for fiber trace, strand status, circuit design, and facility status. • Allow asset reporting with boundary-based filtering (e.g., administrative or ad hoc). • Support generating standard reports like network entity logs, management, and utilization summaries. • Estimate network elements and cable length within selected regions for auditing purposes. • Generate HLD and LLD reports for OSP and ISP designs, including geolocation data for elements like FATs, FDTs, and joint enclosures. • Provide complete printing and plotting capabilities, allowing maps and schematic drawings in various paper formats (A0 to A4) and scales (1:500, 1:1000). • Include standard reports and queries accessible in real-time or batch mode via menu selection. • Support scheduling and subscription of reports for automated generation and distribution. • Customize dashboard to be prepared as per the requirement of GFGNL

Sr. No	Category	Requirement
		• The record of Block, GP and any utility shall be maintained within a 50-meter corridor with an accuracy of 20 cm (25 meters on each side of the road's center line or within the road's right-of-way, whichever is greater)
14	Fiber Inventory Mobile App	• Support network data creation and inventory updates from the field using the mobile app. • Automatically create cables, ducts, and trenches based on the path followed by surveyors. • Display network layers on a map and attach images/documents with geolocation and timestamps. • Provide offline functionality for data capture in remote areas, with synchronization when internet connectivity is restored. • Enable splicing features for Cable-to-Cable, Cable-to-Equipment, and Equipment-to-Equipment connections. • Include cable merge and split features and support network entity grouping and placement. • Allow field users to create work orders, update the network, and submit work orders for managerial approval. • Provide a land base survey module for capturing building data and tagging attributes like name, address, and category (Residential/Commercial).
15	Video Application	• Support video logging for activities like trenching, fiber laying, splicing, and ducting, with GPS coordinates and timestamps. • Record specific details such as trench depth, OFC blowing processes, splicing loss, and water permeability tests, with calibrated measurement tools. • Enable recording of route marker details and generate videos with file descriptions based on predefined nomenclature. • Integrate with DGPS devices for greater accuracy in video surveys. • Provide concurrent viewing windows on the web application for physical work, activity location on Google Maps, and metadata (e.g., OFC route and depth). • The bidder is required to develop the application and all associated forms in accordance with Videography Section (5.8) of the BharatNet 3 program amendment and its subsequent phases. The scope of the bidder includes ensuring that all video applications forms/function with length and timestamp as intended for various objective. Additionally, the bidder must support all necessary requirements for creating a digitized video/photo geotagging tool, forms in web and mobile as and when required or executed by GFGNL and bidder has to support to define SOP with PIA of Phase 3.

Sr. No	Category	Requirement
16	Field Operation Management	• Support lifecycle management of work orders, including assignment, escalation, approval matrices, and fault tracking. • Track work order activities such as fiber cuts, Active and passive installations and failures, with photo and geo-tagging features. • Suggest the shortest route to fault or issue locations using GPS. • Enable work order reassignment and manual mapping of related ticket correlations. • Assign work orders based on priority, SLAs, due dates, required skills, dependencies, and location proximity to resources. • Manage field force schedules, including appointments and resource availability. • Assign predefined route maps for scheduled maintenance or patrolling services. • Display patrollers' statuses (e.g., unassigned, in-progress, paused) and track field resources in real-time on the map, including driving speed and battery status. • Manager assigns route to Patroller based on roster: one-time/daily/weekly/monthly. • Includes Patroller Name, Planned Route Start/End Times, Actual Route Start/End Times. • Compare planned vs actual path on map, display distance travelled. • Patroller self-check-in capability, Manager approval or denial. • Supervisor web App for leave approval for field forces. • Managers can view feedback from the field force. • Field users update attendance, which determines route/ticket assignment. • Health and safety audit checks before and after activity. • Multiple image formats supported (CPE serial number, Customer Photos, etc.) • Tools for post-installation activities (Speed Test, Ping Gateway, Trace Path). • Mobile app supports offline data load. • Mobile app supports ticket creation. • Manager's mobile app has task and risk management capabilities. • Patroller and FRT receive notifications for assigned tasks. • Patroller can view assigned route on the base map. • Check-in and check-out with selfies for Patrollers.

Sr. No	Category	Requirement
		• Patrollers can raise telecom faults, attach images, and managers assign tickets. • Mobile app supports live communication (Chat Box, SOS).
17	Measurement Book (MB)	• Mobile app for PIA's field personnel to record work details; cannot delete readings. • GFGNL personnel validate entries on-site via GFGNL MB app. • Integration with DGPS for accurate location tracking, compare measurements with GIS data. • IE performs Acceptance Test on measurements, discrepancies visible to PIA in web and mobile apps. • Includes Lengths, Profiles, Cable, Joint Pit/Manholes, Termination, and Splice Loss. • Geotagged images for documentation (e.g., splice loss, cable length). • Web app allows resolution of disputes between PIA and IE. • Assign unique codes to each PIA for tracking network work. • Visualize project timelines, task dependencies, milestones. • Track time spent and task relationships. • Define and track milestones with visual indicators. • Built-in chat for real-time communication, file sharing, and notifications. • Create custom reports based on project needs, KPIs. • Visualize project data on maps with charts (pie, bar, line, etc.). • Generate reports on progress by PIA across daily/weekly/monthly spans. • Graphical and geospatial comparison between planned and actual build data. • GFGNL Person validate network design and inspect work. • GFGNL Person can update plans with redlines, which are visible to GFGNL and PIA. • Preloaded templates for inspections, with pull-down comments and ability to attach free-text. • GFGNL Person can raise queries to PIA, and PIA can respond through their mobile app.
18	Project & Workspace Management	• Workspace Management • Project Managers and Team Owners can create Workspaces and define access permissions. • Workspaces should support team assignment, workflows, and notification templates. • Includes document containers, task templates, and task categories.

Sr. No	Category	Requirement
		Task Management & Visualization • Kanban Board and List View options for task management. • Tasks can be added from templates, copied, and duplicated. • Users can perform complete project planning, track progress, and assign tasks. Work log & Time Tracking • Automated and manual work log recording available. • Timer feature ensures only one active task tracking at a time. Communication & Collaboration • Private notes and public comments within tasks. • Chat functionality for stakeholder communication. Advanced Task Capabilities • Support for subtasks, sequential tasks, and recurring tasks. • Task scheduling, reminders, and delegation features. • Dynamic checklists that prompt users before completing tasks. Additional Functionalities • Geo-tagging for field service tasks. • Dynamic document containers for each task.
19	Training for Installation and Maintenance Staff	• Supplier provides training for the installation, operation, and maintenance of software tools. • All training materials provided in soft and hard copies. • At least 1 week of training for 25 personnel per batch.
20	Minimum User Count	• Admin User: Min. 4 Users • Role based access Users: Min. 150 Users • Viewing/Report Fetching Rights: Min. 100 Users • Customized Dashboard Min. 300 Users • Concurrency -100

Note - Integrated cable Management System for Inside and outside plant. Optical Inventory Module for logical and Physical network for port-to-port connectivity, Route search and service provisioning.

1 Hardware Requirements

The bidder shall estimate the compute sizing required to meet requirements given in this tender and submit valid requirement to GFGNL. The Bidder shall be responsible to manage all the provided infrastructure to meet the requirements to operate and maintain for the contract period.

User Licence requirement:

For mobile GIS user, please consider the following User count for sizing purpose:

- During Implementation phase
- Concurrency: ~200 users
- Total user Count: ~1125
- During O&M phase Concurrency: ~100 users
- Total users Count: ~600

During Project Phase	**Zone**	**Project**	**Total Users asked**
New Ask	6	For PH III	1125+
During O&M Phase	**Zone**	**Project**	**Total Users asked**
New Ask	6	For PH III	600+

XXXII. Network* Management *System (NMS) – Technical Specifications

S.N	Technical Area	Minimum Technical Specification
1	Scope of Monitoring	The NMS shall provide centralized, multi-vendor monitoring of all active BharatNet network elements including IP-MPLS routers, switches, OLTs, ONTs, Wi-Fi access points, transmission links and associated infrastructure.
2	Network Visibility	The system shall offer real-time network visibility from State level down to District, Block, Gram Panchayat and Village level through configurable dashboards.
3	Fault Management	The NMS shall automatically detect network faults, outages and degradation events and generate alarms with severity classification to support timely troubleshooting.
4	Performance Monitoring	The system shall continuously monitor performance indicators such as uptime, latency, packet loss, jitter, throughput and bandwidth utilization.
5	SLA Measurement	The NMS shall calculate and report network availability and uptime as per DBN-defined SLA parameters and serve as the primary source of SLA data.
6	Interoperability and integration	The solution shall support open standards and protocols (such as SNMP and APIs) to ensure interoperability with equipment from multiple OEMs and integration with other S-NOC systems.
7	Alarm Management	Correlation, suppression, root-cause analysis
8	Configuration Management	Centralized configuration, backup and restore
9	Reporting	Daily, weekly, monthly and quarterly SLA and uptime reports

10	Integration	Open APIs for OSS, GIS, C-NOC and PMIS integration
11	Scalability	Minimum support for 100,000+ network elements
12	Other	• It shall provide unified GUI for network management, featuring end-to- end circuit diagrams, topology views, alarm management with root cause analysis, severity levels, and automatic ticketing. • It shall support advanced CMDB functionality for managing active/passive inventory, custom attributes, workflow-based discrepancy resolution, and integration via standard NBIs. • It shall provide auto-discovery of network inventory, circuits, and protection mechanisms with detailed GUI visualization and reporting capabilities. • It shall support for auto-diagnosis, predictive analytics, service outage management, and detailed RCA with actionable alarms and SMS/email notifications. • It shall support customizable network topology views including IP networks, device icons, and geo-location maps with interactive drill- down capabilities. • The proposed NMS/OSS solution should support network configuration management capabilities including configuration backup, restoration, version control, configuration audit trail and policy-based monitoring of managed network devices.
13	Minimum User Count	• Admin User: Min. 6 Users • Role based access Users: Min. 150 Users • Viewing/Report Fetching Rights: Min. 100 Users • Customized Dashboard Min. 300 Users • Concurrency -100 *Above mentioned requirement is indicative. However, Bidder has to ensure the seamlessness experience for accessing the Module/tools/dashboards and should not be any license limitations.

Note: 1) The bidder shall provide a solution capable of supporting regulatory, statutory, audit, tariff, reporting, and compliance requirements as may be prescribed by DBN, DoT, CCA, TRAI, GFGNL, or any other competent authority from time to time.

The bidder shall ensure adequate flexibility in the proposed solution to generate reports and support compliance requirements in prescribed formats, as and when notified by the respective authorities.

2) The proposed NMS/EMS/Inventory solution shall support automated

network discovery, topology visualization and asset synchronization capabilities necessary to maintain accurate network visibility and inventory information across the BharatNet network.

Operations Support System (OSS)

S.N	Technical Area	Minimum Technical Specification
1	Fault Lifecycle Management	The OSS shall manage the complete lifecycle of faults, from receipt of alarms through investigation, resolution and closure.
2	Trouble Ticketing	The system shall automatically generate and track trouble tickets based on fault events received from the NMS, with configurable workflows.
3	MTTR Tracking	The OSS shall track Mean Time to Repair (MTTR) for various fault categories including OFC cuts and equipment failures.
4	Escalation Mechanism	Configurable escalation rules shall be supported based on SLA thresholds, timelines and operational responsibilities.
5	SLA Correlation and compliance	The OSS shall correlate fault, resolution and availability data to support SLA compliance monitoring and reporting. OSS shall calculate the penalty as per the SLA breaching
6	Audit Trail	The system shall maintain a complete audit trail of faults, actions taken, escalation history and closure remarks for inspection and audit purposes.
7	Field Force Tracking	Assignment and performance monitoring of fault teams
8	Root Cause Analysis	RCA capture and reporting
9	Notifications	SMS, email and dashboard alerts
10	Integration	Seamless integration with NMS, CRM, GIS and BSS, Capable to integrate with E-mail & SMS Gateway and third party integration
11	eTOM coverage	it shall support comprehensive eTOM coverage including next generation OSS providing Service assurance and Service fulfilment, spanning, Inventory, Discovery, Service provisioning, Service activation, Fault, Incident, Task, Device, SLA, Performance, Problem and Change management

Business Support System (BSS)

SN	Technical Area	Minimum Technical Specification
1	Leasing Management	The BSS shall maintain records of dark fiber leasing and bandwidth leasing provided to Service Providers and other eligible entities including contract management, billing support, etc..
2	Utilization Tracking	The system shall track utilization of leased assets and services to support monitoring and reporting as required by DBN. This should include resource allocation, provisioning coordination, utilization management, etc. The BSS shall capture, maintain and report utilization information of leased assets/services as required for operational monitoring and DBN compliance. The proposed solution should support configurable utilization parameters, reporting formats, data retention policies and export capabilities. Any future integration requirements with external systems shall be supported through standard APIs/interfaces.
3	FTTH & Subsidy Data	The BSS shall capture and report FTTH connection data and subsidy-linked information required for DBN reporting.
4	Revenue & Monetization Reports	The system shall generate structured reports to support DBN-mandated monetization and revenue-sharing mechanisms.
5	Regulatory Reporting	The BSS shall provide data outputs suitable for integration with DBN systems, Controller of Communication Accounts (CCA) and audit processes.
8	Role-Based Access	Controlled access for finance, operations and management
9	Integration	Integration with CRM, OSS, Inventory and PMIS
10	Compliance	Tariff and non-discriminatory access compliance support

Note: i) The proposed OSS-BSS, Inventory Management, and Service Assurance solution shall support service inventory management, customer-to-service-to-network correlation, service-path visualization, and associated

automation capabilities required for operation and management of the BharatNet network.

ii) The proposed OSS/BSS, NMS/EMS and Service Management solution shall support service assurance, fault correlation, root cause analysis, service degradation monitoring, analytics, and SLA reporting capabilities required for effective operation and management of the BharatNet network.

Customer Relationship Management (CRM)

S.N	Technical Area	Minimum Technical Specification
1	Single-Window Interface	The CRM shall provide a unified interface for managing interactions with Service Providers, FTTH stakeholders and Government users.
2	Service Request Management	The system shall capture, track and manage service requests, provisioning requests and coordination issues.
3	Status Visibility	Stakeholders shall be able to view service status, request progress and basic performance visibility through the CRM.
4	Integration	The CRM shall integrate with OSS and Helpdesk systems to ensure coordinated handling of service issues and complaints.
5	Access Control	Role-based access shall be implemented for different user categories including internal teams and authorized external stakeholders.
6	Purpose	The CRM shall act as a coordination and visibility tool and not as a sales or marketing platform.
7	Data Privacy	Compliance with DPDP Act 2023

Helpdesk & Grievance Management

S.N	Technical Area	Minimum Technical Specification
1	Grievance Logging	The system shall allow logging of grievances and complaints through multiple channels such as phone, portal, email or authorized interfaces.

S.N	Technical Area	Minimum Technical Specification
2	Stakeholder Coverage	Complaints from subscribers, Service Providers, BNUs, vendors and Government stakeholders shall be supported.
3	SLA-Linked Resolution	The system shall support SLA-linked monitoring, escalation and resolution of grievances.
4	Integration	Integration with OSS and NMS shall be provided to link complaints with relevant network or service components.
5	Audit & Transparency	Complete audit trails including timestamps, actions taken and resolution outcomes shall be maintained.
6	Reporting	The system shall provide transparent grievance resolution reports for DBN, DoT and State authorities.
5	Grievance Categorization	The system shall provide categorization of Service, billing, network, vendor issues
6	Analytics	Complaint trends and resolution KPIs
7	Notifications	Acknowledgement and closure alerts
8	Reporting	Monthly and quarterly grievance reports
		a.The help desk solution shall be converged communication system supporting analog and IP devices on a server-gateway architecture, scalable up to 25 stations. b.It shall be SIP-based voice network with full redundancy (1:1) and support for IPv6 for futureproofing. c.It shall support ACD features include skill-based routing, customizable queuing, real-time statistics, and agent chat. d.It shall support IVR capabilities encompass voice support, HTTP/XML integration, outbound campaigns, and IVR application performance reporting. e.It shall support email integration with Exchange for queuing, routing, and agent automation, real-time supervisor reporting. f.It shall provide IP Phones with monochrome display, speakerphone, headset support, SNMP/DHCP/DNS protocols, and QoS. g.It shall provide video conferencing system with H.265/H.264 support, 1080p resolution, dual monitor HDMI/DVI outputs, and cloud platform compatibility.

Inventory & Asset Management

SN	Technical Area	Minimum Technical Specification
1	Asset Repository	The system shall maintain a centralized repository of physical BharatNet assets such as OFC routes, fibers, equipment and nodes.
2	Logical Inventory	Logical assets including ports, services, bandwidth allocations and connectivity relationships shall be maintained.
3	GIS Integration	Integration with GIS platforms shall be supported to provide location-based asset visibility.
4	Asset Lifecycle	The system shall track lifecycle events such as commissioning, utilization, leasing and changes like asset movement, upgrade and retirement.
5	DBN Synchronization	Asset data shall be synchronized with DBN asset registers and reporting systems as required where custodian and ownership are to be maintained,
6	Audit Readiness	Audit-ready reports shall be available for Independent Engineer (IE), DBN and other statutory authorities.
7	Scope Clarification	The system is intended for asset governance and utilization tracking and shall not function as a financial ERP or depreciation system.

XXXIV.Hyper Converged Infrastructure:

S.N	Technical Parameter	Minimum Technical Specification
1	Platform Architecture	• The proposed solution shall be a Hyper-Converged Infrastructure (HCI) integrating compute, storage and virtualization into a unified platform. • The architecture shall be software-defined and distributed, eliminating single points of failure. • Centralized management for compute, storage, and network shall be provided.
2	Node Configuration	• Minimum 4 HCI nodes ~~(3+1 or better)~~ shall be proposed. • Each node shall have: – Dual processors, minimum 24 cores per processor – Minimum 256 GB RAM per node – Local storage consisting of SSD/NVMe drives for cache and capacity tier – Redundant power supplies and networking

3	Usable Capacity	• The solution shall provide minimum 100 TiB (BASE 2) usable capacity, after applying protection mechanisms. • Usable capacity shall be without considering ~~compression/deduplication.~~ compression,deduplication,eraser coding without any overhead , any meta data • Capacity shall support growth of GIS (non-video) and NMS workloads.
4	Storage Architecture	• Storage shall be software-defined and distributed across HCI nodes. • Support hybrid or all-flash configurations using SSD/NVMe drives. • Intelligent data placement and caching mechanisms shall be provided.
5	Data Protection & Resiliency	• The system shall ensure protection against minimum ~~two~~ One simultaneous failures (disk/node). • Data protection shall be implemented using replication or erasure coding. • No single point of failure shall exist across nodes, disks, or controllers.
6	Performance Requirements	• The HCI solution shall deliver minimum 150,000 IOPS at cluster level. • Latency shall be sub-millisecond for read/write operations. • The platform shall support mixed workloads (GIS DB, NMS, analytics).
7	Hypervisor Support	• The platform shall support enterprise hypervisors such as ~~VMware~~ Virtualization Software / Hyper-V / KVM. • Features shall include live migration, HA, and dynamic resource allocation. • Hypervisor licensing shall be included (if proprietary).
8	Scalability	• The platform shall support linear scale-out by adding nodes without downtime. • Both compute and storage capacity shall scale seamlessly. • Minimum 30–40% future scalability shall be supported without replacement.
9	Storage Features	• Support for thin provisioning, snapshots, cloning, replication, QoS. • Compression and deduplication ~~(optional but supported).~~ without any overhead , any meta data • Policy-based storage management shall be available.

10	Integration with Cloud Storage	• The solution shall support integration with cloud/object storage for archival (GIS video use case). • Ability to reference, retrieve, and index externally stored data shall be available. • APIs / connectors for hybrid integration shall be provided.
11	Networking Requirements	• Each node shall support minimum dual or 2 × ~~10/25/~~40/100 GbE interfaces. • Support for VLAN, network isolation and redundancy. • Internal cluster networking shall be optimized for storage traffic.
12	Management & Automation	• Unified management console (single pane of glass). • Role-based access control (RBAC). • Integration with AD/LDAP. • REST APIs for automation and orchestration. • GUI and CLI access.
13	Monitoring & Analytics	• Real-time monitoring of compute, storage, and network. • Alerts, capacity planning, and performance analytics. • Predictive failure detection and reporting tools.
14	Availability & Operations	• Minimum 99.99% availability at platform level. • Support for non-disruptive upgrades and maintenance. • Automatic failover and workload balancing.
15	Backup & Data Protection	• Integration with enterprise backup solutions, bidder shall provide the back up solution on cloud without any extra cost to GFGNL. • Support for snapshot-based backup and replication. • Capability to offload backup to cloud/object storage.
16	Security Features	• Encryption at rest and in transit. • Secure multi-tenancy* support. • Compliance with standard IT security practices. • Secure key management (KMIP compliant optional).
17	Licensing	• All necessary licenses for HCI, storage, virtualization, replication, and management shall be included. • No additional licensing required for usable capacity.
18	Implementation & Support	• Complete installation, configuration, and commissioning by OEM/OEM-authorized partner. • 24×7 support with minimum 5 years warranty, extendable up to 10 years. • Firmware, software updates, and patches included.
19	Interoperability	• Solution shall support integration with existing DC infrastructure and applications (GIS, NMS, OSS/BSS).

		• API-based integration capability with third-party systems.
20	No Vendor Lock-In (Important Clause)	• The solution shall be infrastructure portable. • Migration to refreshed hardware or another environment shall not require re-licensing. • Data export in standard formats shall be supported.

***Multi-tenancy:** In HCI (Hyper-Converged Infrastructure), Secure Multi-Tenancy means the solution shall allowing multiple users, departments, customers, or department of phase-I(BSNL) & Phase-II (GFGNL)BharatNet to share the same HCI infrastructure while ensuring that each organizations/department data, network, workloads, and management access remain completely isolated and secure

Note:
The proposed HCI solution should be scalable enough to serve the requirements of the GFGNL for entire 10 years of contract duration.

XXXV. Leaf switches:

S.N	Technical Parameter	Minimum Technical Specification
1	Architecture & Form Factor	• L2/L3 Ethernet switch with non-blocking architecture. • 1U rack-mountable with console and OOB management port. • Modular, stable operating system with process isolation.
2	Port Density & Throughput	~~• Minimum 48 × SFP28 (1/10/25 GbE) ports.~~ ~~• Minimum 8 × QSFP28 (40/100 GbE) uplink ports.~~ ~~• Switching capacity ≥ 4 Tbps or equivalent line-rate performance.~~ For 24 Ports , Minimum 4 × QSFP28 (minimum 40 GbE) uplink ports. Remaining shall be Minimum (1/10/25/100 GbE) ports With Suitable switching and backplane capacity. • All ports shall operate at line rate without oversubscription.
3	HCI & Data Center Compatibility	• Switch shall support deployment in HCI environments with high east-west traffic. • Optimized for low latency and high throughput intra-cluster communication. • Architecture shall be IP-based, with no dependency on SAN/Fibre Channel switching.
4	Spine–Leaf Fabric Support	• Support for EVPN-VXLAN architecture. • Symmetric IRB support for east-west traffic optimization.

		• Suitable for spine-leaf or leaf-access deployments (EVPN optional but supported).
5	Layer 2 Features	• IEEE 802.1Q VLAN tagging. • VLAN creation/modification/deletion. • Link aggregation (LACP) support. • Minimum 32 port-channel groups. • Loop detection and link failure detection mechanisms.
6	Layer 3 Features	• Support static and dynamic routing (OSPF, BGP). • Support for IPv4 and IPv6 dual stack. • Support for BFD for fast convergence. • Enterprise-grade scale (indicative): – ≥ 50K–100K routes – ≥ 50K MAC addresses
7	Fabric & Gateway Redundancy	• Support Anycast Gateway / VRRP or equivalent. • Fast failover and high availability in leaf fabric. • Support VXLAN overlay networking.
8	Quality of Service (QoS)	• Support CoS and DSCP classification. • Traffic shaping, policing, and rate limiting. • Priority queuing and congestion management (e.g., WRED).
9	Security Features	• Role-Based Access Control (RBAC). • AAA integration (RADIUS / TACACS+). • Secure access via SSHv2. • ACLs and port-based security. • Control plane protection mechanisms.
10	Monitoring & Telemetry	• Support SNMP, sFlow/NetFlow/IPFIX (or equivalent). • Optional support for streaming telemetry (gNMI/gRPC). • Integration with NMS and syslog servers.
11	Traffic Visibility & Troubleshooting	• Local and remote port mirroring. • Packet capture and traffic analysis capability. • Broadcast, multicast, and unknown unicast storm control.
12	High Availability	• No single point of failure. • Redundant (N+1) power supplies. • Hot-swappable components (fans, PSU). • Support stacking/MLAG/virtualization for redundancy.
13	Management & Automation	• CLI and GUI management interfaces. • REST APIs for automation. • Configuration backup and rollback capabilities. • Integration with centralized DC management tools.

14	Interoperability	• Open standards-based implementation. • Integration with NMS, firewalls, security devices, and monitoring tools.
15	Scalability	• Support scale-out architecture for DC expansion. • Suitable for growing HCI workloads over contract period.
16	Standards Compliance	• Compliance with IEEE Ethernet standards. • IPv4 and IPv6 compliance required.

XXXVI. Data Lake / Network Analytics Platform

Sr. No.	Parameter	Minimum Requirement
1	Solution Type	Centralized Data Lake and Analytics Platform for collection, storage, processing and visualization of network operational data
2	Deployment Model	On-premises deployment on proposed HCI infrastructure
3	Storage Capacity	efficiently utilizes the proposed HCI infrastructure and coexists with all other S-NOC applications, including EMS for newly deployed active network elements, without degradation of performance or functionality
4	Data Sources	Support ingestion from NMS, EMS, Syslog Servers, SNMP Collectors, GIS Systems, Helpdesk/Ticketing Systems, Inventory Systems and third-party applications through APIs
5	Data Ingestion	Real-time and batch data ingestion with support for API, Syslog, SNMP, CSV and database connectors
6	Data Formats	Support structured, semi-structured and unstructured data formats including CSV, JSON, XML and Log Files
7	Data Processing	Data aggregation, filtering, normalization and correlation capabilities
8	Analytics Engine	Built-in analytics engine capable of trend analysis, anomaly detection, predictive analytics and capacity forecasting
9	Dashboard & Visualization	Web-based customizable dashboards with drill-down capability and graphical reports
10	Geographic Analytics	Visualization and reporting based on District, Taluka, Block, GP and Urban/Rural classifications
11	Historical Reporting	Support historical performance analysis and comparison across configurable periods
12	Search Capability	Full-text search and data discovery across ingested datasets
13	User Management	Role-Based Access Control (RBAC) with authentication and audit logging
14	Open APIs	REST API support for integration with external systems and AI/ML tools

15	Data Retention	The Data Lake/Analytics Platform shall support configurable retention, archival and data lifecycle management policies. The bidder shall size the solution considering expected data growth, analytics requirements, retention needs and optimal utilization of the proposed HCI infrastructure hosting EMS and other S-NOC applications.
16	Security	Encryption for data at rest and data in transit
17	Availability	Solution shall support high availability when deployed on the proposed HCI infrastructure
18	Scalability	Capacity expansion through addition of storage and compute resources without replacement of existing infrastructure

Note:

I. At present, the exact number of third-party applications/APIs requiring integration cannot be quantified, as such requirements will depend on operational, business, and stakeholder needs arising during the project period. Bidders are advised to provision a standards-based, open, and scalable integration framework capable of interfacing with external systems through industry-standard APIs/protocols.

II. Any integration requirement identified during the contract period shall be undertaken by the selected bidder as part of the scope of work without any commercial implication to GFGNL, provided such integrations are based on standard API/interface mechanisms and do not require procurement of additional third-party software/licenses.

III. The Data Lake shall support analytics for network status trends, utilization trends, SLA performance, risk visualization and performance optimization insights based on the terms and conditions in the RFP but not limited to SLA/KPI mentioned in the section-07. Reports may customise as per the central (DBN/GFGNL/DST) requirement.

IV. The objective of the Data Lake / Network Analytics Platform is to provide valuable analytics, dashboards, reports, and insights required for effective monitoring, management, governance, and decision-making for the BharatNet network and associated services.

V. Considering the evolving operational requirements of the project, it is not feasible to define a fixed number of reports at this stage. Accordingly, the number of reports, report formats, level of detail, data sources, analytics requirements, and reporting frequency shall be finalized during project execution through mutual consultation and agreement among GFGNL, the Independent Engineer (IE), and the PIA.

VI. The PIA shall ensure that the proposed platform is sufficiently flexible, configurable, and scalable to support the reporting, dashboarding, analytics, and data visualization requirements envisaged under the project. Bidders are advised to size and price their solution accordingly.

OPTICAL FIBRE CABLE LAYING WORKS

a) Scope

The Engineering Instructions spelt out in this document deal with the methods to be adopted for underground Optical Fiber Cable laying in PLB HDPE ducts and termination of OF Cables at Gram Panchayats (GPs) for BharatNet Projects. The methods of underground OFC laying included in this EI are

1.Open trenching method

2.Horizontal drilling method (HDD)

Under this RFP unified rates have been taken irrespective of the method used for OFC laying, therefore PIA has to take appropriate decision to adopt any of the above method depending upon the feasibility, time frame, meeting SLA over the contract period and O&M. The PIA has to follow the guidelines for open trenching method or HDD method adopted by him as under. To ensure quality in OFC laying using HDD method, the PIA shall be mandated to use appropriate tool for capturing machine recorded depth data.

b) Optical Fibre Cable Laying Approach

On the basis of the survey reports done by CONTRACTOR and further approved by GFGNL, routes for OF cable laying shall be finalized. Road Cutting Permission shall be obtained from road and rail authorities for laying the Optical Fiber Cable along the finalized roads and at rail / road crossing along the route. Generally, O.F. Cable may preferably be laid straight as far as possible along the road near the boundaries, away from the burrow pits. When the O.F. Cable is laid along the National Highways, Cable should run along the road land boundary or at a minimum distance of 15 meters from the center line of the road where the road land is wider as the OFC carries high capacity traffic and is planned for about 25 to 30 years of life. It is essential that the cable is laid after obtaining due permission from all the concerned authorities to avoid any damage (which may result in disruption of services / revenue loss) and shifting in near future due to their planned road widening works. For obtaining RoW GFGNL will facilitate the CONTRACTOR.

In special cases where it may be necessary to avoid burrow pits or low lying areas, the Cable may be laid underneath the shoulders at a distance as per the approval received from the ROW authorized agency.

While laying new cables/ rectifying asset, the PIA must coordinate with the relevant authorities, such as those responsible for roads, gas lines, bridges, or railways, etc. The tenderer will not cover any additional costs associated with this coordination, installation and maintenance. The PIA also assumes all future risks associated with the new cable laying.

In case of usage of utility tunnel, PIA shall be paid 30% of discovered financial bid line item no.1a/1b/1c

c) General

Soil Classification

Soil shall be classified under two broad categories Rocky and Non-Rocky, The soil is categorized as rocky if the cable trench cannot be dug without blasting and / or chiseling. All other types of soils shall be categorized also as Rocky including Murrum & soil mixed with stone or soft rock.

Rocky soil

The terrain which consists of hard rocks or boulders where blasting/ chiseling is required for trenching such as quartzite, granite, basalt in hilly areas and RCC (reinforcement to be cut through but not separated) and the like.

d) The Optical Fibre Cable shall be laid through PLB HDPE Ducts buried at a nominal depth of 165cm. The steps involved in OF Cable laying are as under

Excavation of trench up to a nominal depth of 165 cm in non-Rocky soil, according to construction specifications along National/State Highways/other roads and in built up /rural areas. Under exceptional conditions/ genuine circumstances due to site constraints/ soil conditions, relaxation can be granted by the competent authority for excavation of trench to a depth lesser than 165cm. Such relaxation shall be given as per the laid down norms/ procedures being set by State/SIA and with the approval of the competent authority. The payment in such cases shall be made on pro-rata basis as per the laid down norms adopted by the concerned State/SIA.

Laying of PLB HDPE Ducts/coils coupled by sockets in excavated trenches, on bridges and culverts, as per construction specification and sealing of PLB HDPE Ducts pipe ends at every manhole by end-plugs of appropriate size.

Providing additional protection by R.C.C. Pipes/GI pipes and/or concreting/chambering, wherever required according to construction specification.

Fixing of GI pipes/troughs with clamps on culverts/bridges and/or chambering or concreting of G.I. Pipes/troughs, wherever necessary.

Laying Protection Pipes on Bridges and Culverts. In case trenching and pipe laying is not possible on the culverts, the pipes shall be laid on the surface of the culverts/bridges after due permission from the competent authority within the concerned State/SIA as per construction specification.

Back filling and Dressing of the Trench according to construction specifications.

Manhole of size (1.0 m length x 1.0 m width x 1.65 m Depth) to be installed as loop chamber at following locations (but not limited to) as per industry best practice,

1. Every Km
2. At both sides of road crossings, culvert and bridge crossings.

At Every cable pulling location for housing the OF Cable loop & Pulling Optical Fiber Cable using proper tools and accessories. Sealing of both ends of the PLB HDPE pipe in manhole/joint chamber by hard rubber bush of suitable size to avoid entry of rodents into the PLB HDPE Ducts, putting split PLB HDPE Ducts and split RCC pipes with proper fixtures over cable in the manhole to protect the bare cable.

A loop of minimum ~~25~~ 20 meter of OFC will be left in every manhole. Sealing of both ends of the PLB HDPE pipe in manhole by hard rubber bush of suitable size to avoid entry of rodents into the PLB HDPE Ducts.

Digging of pit of size 2-meter x 2 meter x 1.8 meter (depth) for fixing of Jointing chambered-cast RCC cover or stone of suitable size on jointing chamber to protect the Joint and backfilling of jointing chamber with excavated soil.

Digging of pits 50 cm to 100 cm towards jungle side at every manhole and jointing chamber along the route to a depth of 75cm fixing of route Indicator/joint indicator, concreting and backfilling of pits. Painting of route indicators with Blue colour and joint Indicator by Grey colour and sign writing denoting route/joint indicator number and marked as “GFGNL”, as per construction specification.

Dimension Of MH/HH Chambers:

#	Description	Proposed Chamber Specifications	Remarks
1	INNER DIAMETER	85 CM	
2	THICKNESS	7.5 CM	
3	HEIGHT IN JOINT CHAMBER (1+1 COLLAR EACH COLLAR 50CM HEIGHT)	100 CM	ONLY 1 COLLAR OF 100 CM HEIGHT IS USED
4	HORIZONTAL IRON ROD RING USED	6 MM	
5	HORIZONTAL IRON ROD RING USED	4 NOS.	
6	VERTICAL BARS IRON	10 MM	
7	VERTICAL BARS IRON USED	10 NOS.	
8	TOP COVER THICK	100 MM	
9	BOTTOM COVER THICK	50 MM	
10	CONCRETING	MIX: 01:02:03	

Note:

I. All OFC terminated at the MH/HH with JC(Joint Splice Clouser) should be done with proper

earthing. Same shall be applicable for FDMS termination locations as per standard telecom practices for safety/life threat avoidance.

II. Proper Identifications with tagging of Cable entry direction for easy maintenance inside clouser.

e) Specifications of Materials to be used

PLB HDPE Duct

Optical Fiber Cables should be pulled though Permanently Lubricated HDPE Duct of 40mm/33 mm size conforming to the specifications as per. TEC/GR 72030:~~2019~~ 2025 with latest Amendments.
The Ducts shall be blue in colour and single color per each island and have the identification markings as per TEC GR wherein "Gujarat Fibre Grid (GFGNL)" logo shall be marked as GFGNL's name

Push fit Coupler
Push Fit couplers shall be used for coupling PLB HDPE ducts/coils. The specifications of the couplers shall be as per GR no TEC/GR 72030:~~2019~~ 2025 with latest amendments.

End Cap
End Cap shall be used for sealing the ends of the empty ducts, prior to installation of the OF Cable and shall be fitted immediately after laying the duct to prevent the entry of any dirt, water, moisture, insects/rodents etc. It should confirm to TEC GR No. TEC/GR 72030:~~2019~~ 2025 with latest amendments. The ends of the PLB HDPE ducts/coils laid in the manholes should be closed with End Caps. The End Caps used should be suitable for closing40mm/33mm PLB HDPE ducts/coils. A suitable arrangement should be provided in the End Cap to tie PP Rope. (See figure-1 for details)

Cable sealing Plug
This shall be used to seal the end of the ducts perfectly, after the OF cable is pulled in the duct. For pulling the cable through the ducts, it is necessary to provide manholes at that location and also at bends and corners wherever required. The ends of the PLB HDPE ducts/coils are closed with Cable sealing Plugs. The End Plugs used should be suitable for closing 40mm/33mm PLB HDPE ducts/coils. The Cable sealing plug shall confirm to TEC GR No. TEC/GR 72030:~~2019~~ 2025 with latest amendments. (Wherever blowing technique is used for laying OF Cable, at the discretion of the CPSUs concerned, the hand holes/manholes required for accessing the cable during cable laying can be at longer distances depending upon requirement.)

RCC Full Round Pipes: Reinforced cement concrete pipes (spun type) coupled with RCC collars sealed with cement mortar used to provide additional protection to PLB HDPE Ducts/coils at lessor depths should be of full round, NP-2 class and size 100 mm (internal diameter), conforming to IS standard 458-1988 with latest amendments. The pipes should have a nominal length of 2 meters.

The RCC collars should be properly sealed using cement mortar 1:3 (1:53 grade cement of reputed brand, 3: fine sand without Impurities). If case of long spans, every third joint will be embedded in a concrete block of size 60 cm (L) x 40cm (W) x 25 cm (H) of 1:2:4 cement concrete mix (1: cement, 2: coarse sand, 4: stone aggregate of 20 mm nominal size) so that the alignment of RCC pipes remain firm and intact. Also, both ends of RCC pipes spans will be sealed by providing concrete block of size 40 cm (L) x 40 cm (W) x 25 cm (H) of 1:2:4 cement concrete mix to avoid entry of rodents.

RCC Split Pipes: The split Reinforced cement concrete pipes (spun type) with in-built collars are used to provide additional protection to PLB HDPE Ducts/coils should be of 100mm internal dia.(Spotted), Class--NP-3, Thickness: 25mm, Length: 2 Meters with inbuilt collaret one end, Conforming to ISI Specification IS: 458, 1988 with latest amendment

G.I. Pipes: G.I. pipes should be of medium duty class having inner diameter of 50mm andshould conform to specifications as per IS 554/1985 (revised up to date) IS 1989 (Part- I), 1900 Sockets (revised up to date) & IS 1239 (Part-II) 1992 (revised up to date).

DWC Pipes: Use of normal duty DWC (Double walled corrugated) HDPE pipe confirming to TEC GR no.GR/ with latest amendments shall be preferably utilized as first choice for protection of Optical Fiber Cable instead of GI pipes. The DWC pipes used shall be of size 75/61mm as per table 2 of the said TEC GR.

M.S. Weld Mesh: The PLB HDPE Ducts can also be protected by embedding it in concrete of size of 25 cm x25 cm reinforced with MS weld mesh. The MS weld mesh used should be of 50 mm x 100mm size, 12 SWG, 120 cm in width in rolls of 50m each. One meter of MS weldMesh caters to approx. 3 meters of concreting (See figure ‘2’ for details). The strength of RCC/CC is dependent on proper curing, therefore, it is imperative that water content of CC/RCC mix does not drain out into the surrounding soil. In order to ensure this, the RCC/CC work should be carried out by covering all the sides by yellow PVC sheets of weight not less than 1 kg per 8 sqm to avoid seepage of water into the soil.

Joint Chamber: The Joint chamber shall be provided at every joint location to keep the OF cable joint well protected and also to house extra length of cable which may be required in the event of faults at a later date. The Joint chamber shall be of pre-cast RCC type as per construction specification. Brick chamber can also be made with prior permission of GFGNL.

Rubber Bush: To prevent entry of rodents into PLB HDPE DUCTS, the ends of PLB HDPE DUCTS are sealed at every manhole and joint using rodent resistant hard rubber bush (cap) after optical Fiber cable is pulled. The rubber bush should be manufactured from hard rubber with grooves and holes to fit into 40 mm PLB HDPE DUCTS pipe, so that it should be able to prevent the entry of insects, rodents, mud, and rainwater into the PLB HDPE DUCTS pipe. It should conform to TEC GR with latest amendments. (See Figure-3)

Route/Joint Indicator: The Route/Joint indicators are co-located with each manhole/joint chamber. In addition Route indicators are also to be placed where route changes direction like road crossings etc. Either RCC/Pre-cast or Stone based route indicators can be used. The detailed specification and design of the same shall be as per construction specification. Generally, Stone Route indicators shall be used for the BharatNet Project. Alternatively electronic markers shall be used for joint indicators by fixing/tying them to joint closure.

f) Exacavation Of Trenches

Trenching

Location and Alignment of the Trench: In built up areas, the trench will normally follow the foot-path of the road except where it may have to come to the edge of the carriage way cutting across road with specific permissions from the concerned authorities maintaining the road (such permissions shall be obtained by the department as per MOU signed with respective State Govt.). Outside the built up limits the trench will normally follow the boundary of the roadside land. However, where the road side land is full of burrow pits or afforestation or when the cable has to cross culverts/ bridges or streams, the trench may come closer to the road edge or in some cases, over the embankment or shoulder of the Road (permissions for such deviations for cutting the embankment as well as shoulder of the road shall be obtained). The alignment of the trench will be decided by a responsible official of the GFGNL

Once the alignment is marked, no deviation from the alignment is permissible except with the approval of GFGNL. While marking the alignment only the center line will be marked and the CONTRACTOR shall set out all other work to ensure that, the excavated trench is as straight as possible. The CONTRACTOR shall provide all necessary assistance and labor, at his own cost for marking the alignment. CONTRACTOR shall remove all bushes, undergrowth, stumps, rocks and other obstacles to facilitate marking the centre line without any extra charges. It is to be ensured that minimum amount of bushes and shrubs shall be removed to clear the way and the CONTRACTOR shall give all, consideration to the preservation of the trees.

The line-up of the trench must be such that PLB pipe(s) shall be laid in a straight line, both laterally as well as vertically except at locations where it has to necessarily take a bend because of change in the alignment or gradient of the trench, subject to the restrictions mentioned elsewhere.

Line-Up: The line-up of the trench must be such that PLB HDPE Ducts shall be laid in a straight line except at locations where it has to necessarily take a bend because of change in the alignment or gradient of the trench, subject to the restrictions mentioned elsewhere.

Method of Excavation

In built up areas, the PIA shall resort to use of manual labour / HDD only to ensure no damage is caused to any underground or surface installations belonging to other public utility services and/or private parties.

However, along the Highways and cross country there shall be no objection to the PIA resorting to mechanical means of excavation, provided that no underground installations existing the path of excavation, if any, are damaged.

There shall be no objection to resort to horizontal boring to bore a hole of required size and to push through G.I. Pipe (50 mm ID) through horizontal bore at road crossing or rail crossing or small hillocks etc.

All excavation operations shall include excavation and 'getting out'. 'Getting out' shall include throwing the excavated materials at a distance of at least one meter or half the depth of excavation, whichever is more, clear off the edge of excavation. In all other cases 'getting out' shall include depositing the excavated materials as specified.

In Rocky strata excavation shall be carried out by use of electro mechanical means like breakers/ jack hammers or by blasting wherever permissible with express permission from the competent authority. If blasting operations are prohibited or not practicable, excavation in hard rock shall be done by chiseling / jack hammers.

Trenching shall as far as possible be kept ahead of the laying of pipes. PIA shall exercise due care that the soil from trenching intended to be loose for back filling is not mixed with loose debris. While trenching, the PIA should not cause damage to any underground installations belonging to other agencies and any damage caused should be made good at his own cost and expense.

Necessary barricades, night lamps, warning board and required watchman shall be provided by the PIA to prevent any accident to pedestrians or vehicles. While carrying out the blasting operations, the PIA shall ensure adequate safety by cautioning the vehicular and other traffic. The PIA shall employ sufficient man-power for this with caution boards, flags, sign writings etc.

The PIA should provide sufficient width at the trench at all such places, where it is likely to cave in due to soil conditions without any extra payment. A minimum free clearance of 15 cm should be maintained above or below any existing underground installation. No extra payment will be made towards this. In order to prevent damage to PLB HDPE DUCTS over a period of time, due to the growth of trees, roots, bushes, etc., the PIA shall cut them when encountered in the path of alignment of trench without any additional charges.

In large burrow pits, excavation may be required to be carried out for more than 165 cm in-depth to keep gradient of bed less than 15 degrees with horizontal. If not possible as stated above, alignment of trench shall be changed to avoid burrow pit completely.

Depth and Size of the Trench

The depth of the trench from top of the surface shall not be less than 165 cm unless otherwise relaxation is granted by State/SIA under genuine circumstances.
In rocky terrain, less depth shall be allowed only in exceptional circumstances with additional protection where it is not possible to achieve the normal depth due to harsh terrain/ adverse site conditions encountered. This shall be done only with the approval of the State/SIA. This shall be properly documented. In all cases, the slope of the trench shall not be less than 15 degrees with the horizontal surface. The width of the trench shall normally be 45 cm at the top & 30 cm at the bottom.
In case, additional pipes (HDPE/GI/RCC Pipes) are to be laid in some stretches, the same shall be accommodated in this normal size trench.
When trenches are excavated in slopes, uneven ground and inclined portion, the lower edge shall be treated as top surface of land and depth of trench will be measured accordingly. In certain locations, such as uneven ground, hilly areas and all other Places, due to any reason whatsoever it can be ordered to excavate beyond standard depth of 165 cm to keep the bed of the trench as smooth as possible. Near the culverts, both ends of the culverts shall be excavated more than 165 cm to keep the gradient less than 15 degree with horizontal. For additional depth in excess of 165 cm, no additional payment shall be applicable.
If excavation is not possible to the minimum depth of 165 cm, as detailed above, full facts shall be brought to the notice of the State/SIA in writing giving details of location and reason for not being able to excavate that particular portion to the minimum depth.
Approval shall be granted by the State/SIA in writing under genuine circumstances. The decision of the State/SIA shall be final and binding on the PIA. All the relaxations granted as specified above shall be dealt with as per the laid down norms and procedure of State/SIA.

Dewatering: The PIA shall be responsible for all necessary arrangements to remove or pump out water from trench. The PIA should survey the soil conditions encountered in the section and make his own assessment about dewatering arrangement that may be necessary. No extra payment shall be admissible for this.

Wetting: Wherever the soil is hard due to dry weather conditions, if watering is to be done for wetting the soil to make it loose, the same shall be done by the PIA. No extra payment shall be admissible for this.

Blasting: For excavation in hard rock, where blasting operations are considered necessary, the PIA shall obtain approval of the State/SIA in writing for resorting to blasting operation. The PIA shall obtain license from the State/SIA for undertaking blasting work as well as for obtaining and storing the explosive as per the Explosive Act, 1884 as amended up to date and the explosive Rules, 1983. The PIA shall purchase the explosives fuses, detonators, etc. only from a licensed dealer. Transportation and storage of explosive at site shall conform to the aforesaid Explosive Act and Explosive Rules. The PIA shall be responsible for the safe custody and proper accounting of the explosive materials. Fuses and detonators shall be stored separately and away from the explosives. The State/SIA or his authorized representative shall have the right to check the PIA's store and account of explosives. The PIA shall provide necessary facilities for this. The PIA shall

be responsible for any damage arising out of accident to workmen, public or property due to storage, transportation and use of explosive during blasting operation. Blasting operations shall be carried out under the supervision of a responsible authorized agent of the PIA (referred subsequently as agent only), during specified hours as approved in writing by the State/SIA. The agent shall be conversant with the rules of blasting. All procedures and safety precautions for the use of explosives drilling and loading of explosives before and after shot firing and disposal of explosives shall be taken by the PIA as detailed in IS: 4081 safety code for blasting and related drilling operation.

Trenching Near Culverts/ Bridges: The PLB HDPE Ducts shall be laid in the bed of culvert at the depth not less than 165 cm protected by RCC pipes as decided by State/SIA. Both ends of culverts shall be excavated more than 165 cm in depth to keep the gradient of not less than 15 degree with horizontal. The bed of trench should be as smooth as possible.

While carrying out the work on bridges and culverts, adequate arrangement for cautioning the traffic by way of caution boards during day time and danger lights at night shall be provided .In case of small bridges and culverts, where there is a likelihood of their subsequent expansion and remodelling, the cable should be laid with some curve on both sides of the culvert or the bridge to make some extra length available for readjustment of the cable at the time of reconstruction of culvert or the bridge.

g) Laying OF PLB HDPE Ducts

After the trench is excavated to the specified depth, the bottom of the trench has to be cleared of all stones or pieces of rock and levelled up properly. A layer of soft soil/or sand (in case the excavated material contains sharp pieces of rock/stones) of not less than 5 cm is required for levelling the trench to ensure that the cable when laid will follow a straight alignment. Adequate care shall be exercised while laying so that the OF cables are not put to undue tension/pressure after being laid as this may adversely affect the optical characteristics of cables with passage of time.

The PIA shall ensure that trenching and pipe laying activities are continuous, without leaving patches or portions incomplete in between. In case intermediate patches are left, measurement of the completed portions will be taken only after work in such left over patches are also completed in all respects.

Preparatory to aligning the pipe for jointing, each length of the PLB HDPE Ducts shall be thoroughly cleaned to remove all sand, dust or any other debris that may clog, disturb or damage the optical Fibre cable when it is pulled at a later stage. The ends of each pipe and inside of each Socket shall be thoroughly cleaned of any dirt or other foreign materials.

After the trench is cleaned the PLB HDPE Ducts/Coil shall be laid in the cleaned trench, jointed with Sockets. Drawing up of PP rope is optional as per TEC GR. In case of use of PP Rope, at every manhole approximately at every 200m or at bends or turns the PP rope will be tied to the HDPE end caps used for sealing the PLB HDPE Ducts, to avoid entry of rodents/mud etc.

At the end of each day work, the open ends of the pipes sections shall be tightly closed with endcaps to prevent the entry of dirt/mud, water or any foreign matter into PLB HDPE Ducts until the work is resumed. In built up area falling within Municipal/Corporation limits, the PLB HDPE Ducts shall be laid with protection using RCC Pipes/ Concreting reinforced with weld mesh (only in exceptional cases).

For lesser depths requiring additional protection in built up areas, towns and cities falling within t the municipal limits, suitable protection shall be provided to PLB HDPE pipes/coils using RCC/DWC full round/split pipes or GI pipes or cement concreting reinforced with MS weld mesh or a combination of any of these as per the site requirement. This shall be done only with the prior instructions/approval of the State/SIA. The specifications for providing each of these protections are given later in this document.

Moreover, in cross country routes, if depth is less than 1.2 meters, protection by using RCC/DWC Pipe shall be provided. State/SIA shall decide about such stretches and type of protection to be provided in view of the site requirements. Normally 63/100 mm RCC /DWC Pipes shall be used for protecting PLB HDPE Ducts but if more than one PLB pipe is to be laid and protected, RCC/DWC Pipe of suitable size to accommodate the required number of PLB Pipes shall be used.

The PLB HDPE Ducts shall be laid in RCC Full Round spun Pipes/GI Pipes as required at Road crossings. The RCC pipes/GI pipes shall extend at least 3 meters on either side of the road at Road crossings. At Road crossings, extra GI/PLB HDPE Ducts may be laid as per the direction of the State/SIA. On Rail bridges and crossings, the PLB HDPE Ducts shall be encased in suitable cast iron as prescribed by the Railway Authorities.

Wherever RCC pipes are used for protection, the gaps between the RCC collars and the RCC pipes shall be sealed using cement mortar 1:3 (1:53 grade cement of reputed brand, 3: fine sand without impurities) to bar entry of rodents. Every third collar of RCC pipes (normally of 2 meters length) and also both ends of RCC Pipes will be embedded in a concrete block of size 40 cm (L)x 40 cm(W) x 25 cm (H) of 1:2:4 cement concrete mix (1:53 grade cement of reputed brand, 2: coarse sand, 3: stone aggregate of nominal size of 20 mm) so that the alignment of RCC pipes remain firm and intact and to avoid entry of rodents.

Wherever GI pipes are used, special care should be taken to ensure that G.I. Pipes are coupled properly with the sockets so as to avoid damage to PLB pipe and eventually the OF Cable in the event of pressure coming on the joint and G.I. Pipe joint giving its way. Rubber bushes shall be used at either ends of the GI pipes to protect PLB pipe. Both the ends of G.I. Pipe will be embedded in a concrete block of size 40 cm (L) x 40 cm ((W) x 25 cm (H) of 1:2:4 cement concrete mix (1:53 grade cement of reputed brand, 2: coarse sand, 3: stone aggregate of nominal size of 20 mm) so that the alignment of G.I. Pipes remain firm and intact and to avoid entry of rodents.

In case of protection by concreting at site, the nominal dimension of concreting shall be 250 mm x250 mm section. Cement Concrete Mixture used shall be of 1:2:4 composition i.e. 1:53 grade Cement of a reputed company, 2: Coarse Sand, 4: Graded Coarse Stone aggregate of 20 mm nominal size, reinforced with MS weld mesh. As the RCC is cast at site, it is imperative to ensure that special care is taken to see that proper curing arrangements are made with adequate supply of water. The PIA shall invariably use mechanical mixer at site for providing RCC protection, to ensure consistency of the mix.

For carrying out concreting work in trenches, yellow PVC sheets of width not less than 1.0 M and of weight not less than 1 kg. Per 8 sq. meters shall be spread and nailed on sides of the trench to form trapezoidal section for concreting in the cleaned trench, to avoid seepage of water into the soil.

A bed of cement concrete mixture of appropriate width and 75 mm thickness shall be laid on the PVC sheet, before laying PLB HDPE ducts. The PLB HDPE Ducts shall then be laid above this bed of concrete. After laying the PLB HDPE Ducts, MS weld mesh is wrapped around and tied and concrete mix is poured to form the cross sectional dimensions as instructed by the State/SIA. The strength of RCC is dependent on proper curing therefore, it is imperative that water content of RCC mix does not drain out into the surrounding soil. Portions where cement concreting has been carried out shall be cured with sufficient amount of water for reasonable time to harden the surface. After curing, refilling of the balance depth of the trench has to be carried out with excavated soil.

The PLB HDPE Ducts/RCC/GI Pipes shall be laid only in trenches accepted by State/SIA or his representative. The PIA shall exercise due care to ensure that the PLB HDPE Ducts are not subjected to any damage or strain.

Water present in the trench at the time of laying the PLB HDPE Ducts shall be pumped out by the PIA before laying the pipes in the trench to ensure that no mud or water gets into the pipes, thus choking it.

In case of nallahs, which are dry for nine months in a year, the PLB HDPE Ducts shall be laid inside the RCC Pipes laid at a minimum depth of 165 cm, as instructed by the State/SIA. The mechanical protection shall extend at least 5 meters beyond the bed of nallah on either side.

Notwithstanding anything contained in clauses referred above, the State/SIA may order, based on special site requirements, that the PLB HDPE Ducts may be encased in reinforced cement concrete, as detailed, ibid. While laying the pipes, a gap of 2 M is kept at convenient locations approx. 200 m apart and at the bends and turns, which will be used as manholes during OF cable pulling. Ends of the PLB HDPE Ducts at the manholes shall be sealed using end caps after tying the PP rope to the end caps to avoid choking of the pipes. In a similar manner, manholes shall be kept while approaching bridges, road crossings etc., as instructed by the State/SIA. The location of the manholes will be decided by the State/SIA

Warning Tap :

Warning tap to be laid in trench as per industry standard. Warning tape to be laid in dense area where in route markers installation at regular intervals are not practically feasible.

Laying Protection Pipes on Bridges and Culverts:

In case trenching and pipe laying is not possible on the culverts, the pipes shall be laid on the surface of the culverts/bridges after due permission from the State/SIA. Of late the bridge construction authorities are providing channel ducts on the footpaths on the bridges for various services. The RCC/DWC/ G.I. Pipes can be laid in these ducts for pulling cables. However, for laying cables on existing bridges, where duct arrangement does not exist, one of the following methods may be adopted.

In case of the Bridges/Culverts, where there are no ducts and where the cushion on the top of the Arch is 50 cm to 100 cm or more, G.I. Pipe (Carrying PLB HDPE pipe and cable) may be buried on the top of the Arch adjoining the parapet wall, by digging close to the wheel guards. Every precaution shall be taken to see that no damage occurs to the arch of the culvert. After burying the GI pipe, the excavated surface on the arch shall be restored.

Where the thickness of the Arch is less than 50 cm, the pipe must be buried under the wheel guard masonry and the wheel guard rebuilt.

If neither of the two methods is possible, the G.I. Pipes/GI Troughs must be clamped on the parapet wall with the clamps. If necessary, the pipes may be taken through the parapet wall at the ends where the wall diverges away from the road.

Methods cited in above clauses should be carried out under close supervision of Road authorities. The surface to be concreted should be thoroughly cleaned and levelled before concreting. At both ends of the Bridges/Culverts, where the GI Pipes /GI Troughs slope down and get buried, the concreting should be extended sufficiently to ensure that no portion of the GI Pipes/GI Troughs is exposed as approved by the State/SIA to protect the pipe/trough from any possible externally caused damage.
Where white wash/colour wash is existing on the Bridges/ Culverts, the same should also be carried out on the concreted portion to ensure uniformity.

h) Back Filling and Dressing of the Trench

Provided that the PLB HDPE pipes have been properly laid in the trench at the specified depth, the back filling operation shall follow as early as practicable. The earth used for filling shall be free from all roots, Grass, shrubs, vegetation, trees, saplings and any other kind of garbage or pebbles. The back filling operation shall be performed in such a manner so as to provide firm support under and above the pipes and to avoid bend or deformation of the PLB HDPE pipes when the pipes get loaded with the back filled earth.
At locations where the back filled materials contains stones/sharp objects which may cause injury to the PLB HDPE pipes and where the excavated or rock fragments are intended to refill the trench in whole or in part, the trench should be initially filled, with a layer of ordinary soil or loose earth (free from any stones/pebbles) not less than 10 cm thick over the pipes.
Back filling on public, roads, railway crossings, footpaths in city areas shall be performed immediately after laying the HDPE pipes. Back filling at such locations shall be thoroughly rammed, so as to ensure original condition so that it is safe for the road traffic. All excess soil/ material left on road/ footpath/railway crossing shall be removed by PIA. However, along the highways and in country side, the excess dug up material left over after refilling should be kept in a heap above over the trench.
In city limits, at any given time not more than 50 Meters length of trench should be kept open and in all places where excavation has been done, no part of the trench should be kept open over night to avoid occurrence of any mishap or accident in darkness.

i) Restoration of Road Surface

Road restoration work to be made with bituminous macadam for semi grouting 50 mm thick and premix carpet surfacing 25 mm thick over the grouted surface (total up to 75 mm thick) including supply of asphalt etc. to evenly match the road, including consolidation and rolling as per standard specification of DSR 1997. This is responsibility of PIA for all restoration work.
Road restoration work with cement concrete 1:4:8 mix for thickness varying from 150 mm to 225 mm, including supply of concrete to be made to evenly match the road.

j) Cable Pulling And Joining/Splicing

CABLE PULLING

Manholes marked during PLB HDPE Ducts pipe laying of approx. size of 2.0 m length x 1.0 m width x 1.65 m depth shall be excavated for pulling the cables. There may be situations where addition manholes are required to be excavated, for some reasons, to facilitate smooth pulling of cable. Excavation of addition manholes will be carried out, without any extra cost. De-watering of the manhole, if required, will be carried out without any extra costs. Dewatering/ De-gasification of the Ducts, if required, will be carried out without any extra costs.
The Optical Fibre cable drums in lengths of approx. 2 km shall be used. The cables shall be blown / manually pulled (in exceptional cases) through already laid PLB HDPE DUCTS. This work is to be carried out under the strict supervision of site in-charge. It shall be ensured that during the blowing / pulling of Cable the tension is minimum and there is no damage to the Cable/Optical Fibres. The PIA will ensure that manufacturer's guidelines for minimum bend radius and tension are followed while installing the OFC. The PIA will handle the Optical Fibre Cable drums as per instructions given by the manufacturer.
After pulling of the drum is completed, both ends of the PLB HDPE DUCTS pipe in each Manhole should be sealed by hard rodent resistant rubber bush, to avoid entry of rodents/mud into PLBHDPE Ducts.
The Manholes are prepared by providing 40 mm split PLB HDPE DUCTS pipe of 2.5 to 3m length and closing the split PLB HDPE Ducts by providing necessary clamps/ adhesive tape as per the directions of State/SIA. Afterwards, the split/cut PLB HDPE DUCTS pipe are covered with 100 mm split RCC pipe of 2m length and sealing the ends of RCC pipe with lean cement solution for protecting bare cable in the manhole. After fixing of RCC Split Pipes necessary back filling/reinstatement and dressing of manholes should be carried out as referred under trenching. The location of the pulling manhole should be recorded for preparation of documentation.
Jointing/ Splicing

Optical Fibre Cable Joints between 96F feeder cable and 48F distribution cable will be at varying distances depending upon the road intersection point from where distribution fibre to be laid for connecting Panchayats. The 12 fibres are to be spliced at every Joint between feeder and distribution cables to provide each GP with minimum 12F connectivity & at both ends (Terminations) in the equipment room as directed by the State/SIA. The infrastructure required for cable splicing i.e.Splicing machine,OTDR,LSPM,Optical talk set,Tool kit etc.

Will be arranged by the PIA and also any additional accessories. e. g. Engine etc. required at site for splicing will also be arranged by the PIA.

The Optical Fibre Cable thus jointed end-to-end will be tested by the State/SIA/TPA officer of Acceptance Testing unit of the concerned State/SIA for splice losses and transmission parameters as specified by BBNL and prevalent at that time. The through Optical Fibre should meet all the technical parameters, specified and no relaxation will be granted.

The PIA will seal and install the Fibre Splice Joint closure assembly as per TEC norms

The PIA will carry one hour of leakage/ water penetration test on Fibre Splice Joint closures after installation.

The PIA will attach Cable tags to all OFC which are entering the Fibre Splice Joint Closure and OFC readings shall be recorded for updating in the As-build and GIS drawings.

The PIA will maintain an As-build route diagram and details for splicing of OFC for each GP through GIS tool having accuracy of 50 cm. The diagram shall indicate the cores from all OFC with their color coding and numbering. PIA will provide As-build route diagram every quarter during implementation phase and on 1st Jan of every year during O&M phase, then only next payment will be processed. These diagrams will be in high resolution pdf plus A2 sized print out covering one block per A2 sheet.

The As-build should incorporate Geo Coordinates (Lat-Long) of all the Point and Line assets as under:

Sr. No.	Layer	Features	Detailed information to be Captured
1	Optical Fiber Cable	Position of OFC Route @ every 10 Meter from the offset, Centre of Road	Lat Long of entire OFC route/ path up to 6 decimal / meter level accuracy, Position of Router, OLT, ONT, FPOI, Splitter, OFC Joints, Couplers, Manholes, Milestones, Culverts, Bridges/nallah, water bodies, crossroads, railway crossings, fly overs and public places like temples/mosque, bus stop, PHC, Post office, School, College, shops & other important landmarks etc
		OFC Cable Specifications and Deployment Details	Depth of OFC **(Recorded at the time of deployment)**, count of terminated and spare fibers, loop, make and size of cable deployed, Logical diagram, OTDR readings, Light Source Power Meter readings, Optical test results for each fibre.
		Route marker details	Cement Route Marker (Lat-Long), details & Route Marker Identification.
		OFC Alignment Details:	Overhead or Underground alignment, type of execution (HDD, OT, Aerial etc.), OFC protection used. ABDs, digial ITP Sheet shall be prepared in two parts, Part I: showing the overall cable laying routes for a block or tree from OLT to the ONT/FTB which shall identify the various cable laying sections and assets. Part II: shall contain detailed drawings of the various cable sections as depicted in Part I mentioned above. i.e. OFC

Sr. No.	Layer	Features	Detailed information to be Captured
			route to be bifurcated in number of Grids of 200 to 250 meters and each Grid to be prepared in separate sheet (A4) with complete details. Each sheet to be assigned. a unique number
		RoW	Railway authority, NH, Forest authority and any other authority limits shall be recorded along with OFC path. Information should be shown in drawing as text (aligned to road centreline) at start/end of every 400 meters drawing or at authority change within 400 meters
		Road features	Length, width and type (RCC, Kuchha, pakka etc.). Variation in width of road may be recorded in meters taking offset from the centre of the road.
		Other Operators/Utility:	Presence of underground OFC of other operators, utility pipes, transmission cable etc. to be captured in map
2	OLT	OLT	Name, Code, Block, District, State, Make, PON ports, Power, Earthing, FDMS, HLD/LLD, Line Diagram
3	ONT	ONT	Name, Code, Block, District, State, Parent OLT, Make, Ports, FTB, Power etc.
4	Fibre splicing	Fibre splicing	Location, Fiber details
5	Splitters	Splitters	Make, Type, Fiber details
6	Joints and Couplers	Joints and Couplers	Location, number, depth, Type, Loop, loss detail
7	Codification	Codification	Codification of all BharatNet assets as per BBNL/NIC coding instructions.
8	Router	Router	Name, Code, Block, District, State, Make, PON ports, Power, Earthing, FDMS, HLD,LLD, Line Diagram

Note:

1. As Built Drawings (ABDs) , digial ITP Sheet shall be uploaded in the GIS platform in GIS format (Shape File, .shp).
2. Readings should invariably be recorded at every bend on the road, road/railway crossings, culverts, diversion etc. at every 5 meters.
3. For point feature like poles, trees, sewerage manholes, other utility chambers, transformers, bore well etc. which are approximately less than 1m diameter/length, shall be captured as a point and if the feature is more than 1m diameter/length, need to take the boundary. Every feature within survey corridor should be shown in drawing.
4. Separate sheets shall be used for recording details of cable sections where cable are laid by open trench, in duct and by HDD method. Separate diagrams (in blown-up details) may be prepared for major road/rail intersections for better clarity of details.
5. For all the linear features, geo coordinates shall be recorded at every turning point.
6. For all the utilities above ground viz. Poles, Manholes and telephone exchanges etc, details shall be recorded in a corridor of 50m (25m on either side of the road centerline or ROW of road whichever is more).
7. To and/or from direction to village, town, city etc. shall be recorded for all roads.

8. All the road KM stones shall be recorded and shown in drawing using symbol provided.
9. All the property boundaries with in the corridor shall be recorded and shown in drawing.
10. All features in the drawings shall be plotted with respect to drawing origin as 0,0,0 using UTM coordinates.
11. Three point's references need to be shown for every joint chamber/Pull through Chamber/Manholes.
12. The details of various assets to be tabulated.
13. Collection of data (Custodianship of GPON equipment, location of school, college, hotels, post office, other Govt. offices, key contacts in GP etc.) in each Gram Panchayat and other important locations. Contact numbers of all the above Offices to be indicated.
14. The GIS mapped lengths shall be calibrated with OTDR measurements.
15. All the diagrams shall bear the signatures of the contractor and the project manager as a proof of accuracy of the details. The diagrams shall be bound in A-4 size book with cover. The cover sheets shall be laminated and should have the following details.

a. Name of the Project Organization.
b. Name of the OFC Link with ID.
c. Name of the Contractor.
d. Name of Survey Agency Rep as part of Acceptance Test.
e. Name of BBNL Rep as part of Acceptance Test.
f. Date of commencement of work.
g. Date of completion of work.

The PIA will use Mid-Span Access Buffer Tube Slitter during mid-span splicing to ensure that buffer jackets of fibre tubes are cut longitudinally to access all ribbons / fibres inside tube and then only required ribbon / fibre cores will be cut for splicing.

During maintenance of the network, PIA will ensure that all fibre cores are spliced at the cut location (and not only live fibre cores) during rectification process. State/SIA/any third party as appointed may audit the health / continuity of all fibre cores at any time and PIA will have to facilitate this exercise by performing LSPM and OTDR testing in presence of this team.

k) Construction of Jointing Chamber :

The joint chambers are provided at every joint to keep the O.F.C. joint well protected and also to keep extra length of cable, which may be, required to attend the faults at a later date. Jointing chambers are to be prepared at the Fibre Point of Interconnect (FPIO) or normally at distance of every 2 km. Actual location of jointing chamber depends on length of cable drum and appropriateness of location for carrying out jointing work, tapping point for 96/48/24 connection.

The jointing chambers are constructed by way of fixing pre-cast RCC chambers/Brick Chambers and covers as per the instructions from State/SIA.

Precast RCC chamber

For fixing precast RCC chamber, first a pit of size 2 m x 2 m x 1.8 m depth shall be required to be dug. Precast RCC chamber shall consist of three parts (i) round base plate of 140 cm diameter and 5 cm thickness in two halves (ii) full round RCC joint chamber with diameter of 120 cm and height of 100 cm and thickness of 5 cm (iii) round top cover will be in two halves with diameter of

140 cm and thickness of 5 cm having one handle for each half in centre and word ‘GFGNL OFC’ engraved on it. (See figure ‘4’). After, fixing the pre cast RCC joint chamber, the joint chamber is filled with clean sand before closing. Back filling of joint chamber pit with excavated soil shall be carried out in the end.

Brick Chamber

For constructing brick chamber, first a pit of size 2m x2 mx1.8 m depth is shall be required to be dug, then, base of the chamber shall be made using concrete mix of 1:5:10 (1 cement, 5 coarse sand, 10 graded stone aggregate of 40mm nominal size) of size of 1.7m x 1.7 m and 0.15 m thickness. Wall of brick chamber should be constructed on this base having wall thickness of 9” using cement mortar mix of 1:5 (1: cement, 5: fine sand). The chamber should have internal dimensions of 1.2 m x 1.2 m and 1 m height. The bricks to be used for this purpose should be of size 9” x 4.5” x 3”, best quality available and should have smooth rectangular shape with sharp corners and shall be uniform in colour and emit clear ringing sound when struck.

The joint chamber should be so constructed that PLB pipe ends remain protruding minimum 5 cm inside the chamber on completion of plastering. The PLB pipes should be embedded in wall in such a way that, the bottom brick should support the pipe and upper brick should be provided in a manner that PLB HDPE pipe remains free from the weight of the construction. The joint chamber should be plastered on all internal surfaces and top edges with cement mortar of 1:3 (1: cement, 3: coarse sand), 12 mm thick finished with a floating coat of complete cement as per standard. Pre-cast RCC slab with two handles to facilitate easy lifting, of size 0.7 m x 1.4 m and of thickness of 5 cm having one handle for each half in centre and word ''OFC' engraved on it are to be used to cover the joint chamber. Two numbers of such slabs are required for one joint chamber. This pre-cast slab should be made of cement concrete mix of 1:2:4 (1: cement, 2: coarse sand, 4: stone aggregate 6 mm nominal size) reinforced with steel wire fabric 75 x 25 mm mesh of weight not less than 7.75 Kg per sq. Meter. The joint chamber is filled with clean sand before closing. Back filling of joint chamber pit with excavated soil shall be carried out in the end

Fixing of Route Indicators / Joint Indicators

Pits shall be dug 50 cm to 100 cm towards jungle side at every Manhole and Jointing chamber for fixing of Route/Joint Indicator. In addition, Route Indicators are also required to be placed where O.F. Cable changes directions like road crossing etc.

The pits for fixing the indicator shall be dug for a size of 60 cm x 60 cm and 75 cm (depth).

The indicator shall be secured in upright position by ramming with stone and murrum up to a depth of 60 cm and concreting in the ratio of 1:2:4 (1: cement, 2: coarse sand, 4 stone aggregate 20 mm nominal size) for the remaining portion of 15 cm. Necessary curing shall be carried out for the concreted structure with sufficient amount of water for reasonable time to harden the structure.

RCC/Pre cast Route Indicators

The route /joint indicator made of pre-cast RCC should have the following dimensions

Base - 250 mm x 150 mm Top - 200 mm x 75 mm Height - 1250 mm (See Figure ‘5’)

~~Stone based Route Indicators~~

~~The route /joint indicators made of Sand/lime Stone Should have the following dimension.~~ The word 'GFGNL OFC' should be engraved on the Route/Joint indicators.

~~Stone to be used (Sand/lime Stone)~~
Indicator Top surface to be rounded
Base 155 mm × 100 mm
Upper 500 mm length to be Tapered width wise as shown in the drawing and homogeneously finished.
Height 650mm (Straight) + 400 mm (Tapered)
The route indicators should be engraved with word 'OFC' of size 80mm length & 50mm, width.
Length 3.5 Ft., top 4"x4" dressed 1Ft. from top & tapered.

(See figure '6' for details of Stone Route Indicators)
The route indicators are to be placed at every 200 mts. and at every place where the cable changes direction. The Route indicators shall painted Blue and placed at 50 to 100 cm away from the centre of the trench towards jungle side. The Joint indicators are placed at OFC joints and placed at 50 to 100 cm away from wall of the joint chamber facing jungle side and are painted Grey. The engraved word "GFGNL OFC" should be painted in white, on route as well as joint indicators. Numbering of route indicators/joint indicators should also be done in white paint. The numbering scheme for route indicators will be Joint No./Route Indicator No. for that joint. For example, 2/6 marking on a route indicator means 6th route indicator after 2nd joint. Additional joints on account of faults at a later date should be given number of preceding joint with suffix A, B, C, and D. For example sign writing 2A on a joint indicator means, additional joint between joint No. 2 and 3. The numbering of existing route/joint indicator should not be disturbed on account of additional joints. Enamel paints of reputed brand should be used for painting and sign writing of route as well joint indicators.
The route and joint indicator shall be painted with primer before painting with oil paint. The material used should bear ISI mark. The size of each written letter should be at least 3.5 cm. The colours of painting and sign writing is as under:
For Joint Indicator: Grey colour
For Route Indicator: Blue colour
For GFGNL OFC & Nos: White colour.

Documentation

The documentation, consisting of the following shall be prepared for each Block and the Panchayats connected to the Block. 4 sets of documentation shall be provided both in Electronic format on CD as well as Hard binded copy.
Route Index Diagrams – General: This diagram shall consist of Cable Route Details on Geographical Map drawn to scale with prominent land marks and alignment of cable with reference to road. This shall be prepared on A-3 sheets of 80 GSM.

Route Index Diagrams –Profile

These diagrams will contain
Make and size of the cable.
Offset of cable from centre of the road at every 10 meters
Depth profile of Cable at every 10 meter;
Details of protection with type of protection depicted on it;
Location of culvert and bridges with their lengths and scheme of laying of PLB HDPE Ducts pipe thereon.
Important landmarks to facilitated locating the cable in future; Location of Joints and pulling manholes.

These diagrams shall be prepared on A-4 sheets of 80 GSM. On one sheet profile of maximum 400 meters shall be given to ensure clarity.
Joint Location Diagram

This diagram will show
Geographical location of all the joints.
Depth of Joint Chamber covers from ground level
Type of chamber (Brick/Pre-cast)
Length of O.F. Cable kept inside the joint chamber from either direction. This shall be prepared on A-4 sheets of 80 GSM.

All the diagrams (1), (2) & (3) shall bear the signatures of the PIA, the State/SIA as a proof of accuracy of the details. The diagrams shall be bound in A-4 size book with cover.
The cover sheets shall be of 110 GSM and laminated. The front cover shall have the following details.
Name of the State/District/Block
Name of the Panchayats connected
Name of the GFGNL with logo
Name of the PIA
Date of commencement of work
Date of completion of work
For each Block 1 sets of above mentioned document shall be submitted to GFGNL.
SAFETY PRECAUTIONS

Safety Precautions when excavating or working in excavations close to electric cables

The Officer in charge (State/SIA) of the work should get full information from Electricity undertaking regarding any electric cables, which are known or suspected to exist near the proposed excavation and unless this is done, excavation should not be carried out in the section concerned. The electricity undertaking should be asked to send a representative and work should be preceded with close consultation with them.

Only wooden handled hand tools should be used until the electric cables have been completely exposed. Power Cables, not laid in conduits, are usually protected from above by a cover slab of concrete, brick or stone. They may or may not be protected on the sides. It is safer, therefore, always to drive the point of the pick axe downwards then uncovering a cable, so that there is less chance of missing such warning slabs. No workman should be permitted to work alone where there are electric cables involved. At least one more man should be working nearby so that help can be given quickly in case of an accident. If disconnection of power could be arranged in that section it will be better. No electric cables shall be moved or altered without the consent of the Electric Authority and they should be contacted to do the needful. If an electric cable is damaged even slightly, it should be reported to the Electric Authority and any warning bricks disturbed during excavation should be replaced while back filling the trench. Before driving a spike into the ground, the presence of other underground properties should be checked. Information on plans regarding the location of power cables need not to be assumed as wholly accurate. Full precautions should be taken in the vicinity until the power cable is uncovered. All electric cables should be regarded as being live and consequently dangerous. Any power is generally dangerous, even low voltage proving fatal in several cases.

Electric shock-Action and treatment :

Free the victim from the contact as quickly as possible. He should be jerked away from the live conductors by dry timber, dry rope or dry clothing. Care should be taken not to touch with bare hands as his body may be energized while in contact. Artificial respiration should begin immediately to restore breathing even if life appears to be extinct. Every moment of delay is serious, so, in the meanwhile, a doctor should be called for.

Safety Precautions while working in public street and along railway lines :

Where a road or footpath is to be opened up in the course of work, special care should be taken to see that proper protection is provided to prevent any accidents from occurring. Excavation work should be done in such a manner that it will not unduly cause inconvenience to pedestrians or occupants of buildings or obstruct road traffic. Suitable bridges over open trenches should be so planned that these are required for the minimum possible time. Where bridges are constructed to accommodate vehicular traffic and is done near or on railway property, it should be with the full consent and knowledge of the competent railway authorities.

Danger from falling material

Care should be taken to see that apparatus, tools or other excavating implements or excavated materials are not left in a dangerous or insecure position so as to fall or be knocked into the trench thereby injuring any workman who may be working inside the trench.

Care when working in Excavations

Jumping into a trench is dangerous. If it is deep, workmen should be encouraged to lower themselves. Workers should work at safe distance so as to avoid striking each other accidentally with tools. If the walls of the trench contain glass bits, corroded wire or sharp objects they should be removed carefully. If an obstruction is encountered, it should be carefully uncovered and protected if necessary. If an obstruction is encountered, it should be carefully uncovered and

protected if necessary. Care must be taken to see that excavated material is not left in such a position that it is likely to cause any accident or obstruction to a roadway or waterway. If possible the excavated material should be put between the workmen and the traffic without encroaching too much on the road.

Danger of cave in

When working in deep trenches in loose soil, timbering up/shoring the sides will prevent soil subsidence. The excavated material should be kept at sufficient distance from the edge of the trencher pit. Vehicles or heavy equipment must not be permitted to approach too close to the excavation.

When making tunnelled opening, it should be ensured that the soil is compact enough to prevent cave in even under adverse conditions of traffic. Extra care should be taken while excavating near the foundations of buildings or retaining walls. In such cases, excavation should be done gradually and as far as possible in the presence of the owners of the property.

Protection of Excavations

Excavations in populated areas, which are not likely to be filled up on the same day should be protected by barriers or other effective means of preventing accidents and the location of all such openings must in any event be indicated by red flags or other suitable warning signs. During the hours from dusk to dawn, adequate number of red warning lamps should be displayed. Supervisory officers should ensure that all excavations are adequately protected in this manner as serious risk and responsibility is involved. Notwithstanding adoption of the above mentioned precautions, works involving excavations should be so arranged as to keep the extent of opened ground and the time to open it to a minimum.

Precautions while working on roads

The period between half an hour after sun-set and half an hour before sunrise, and any period of fog or abnormal darkness may also be considered as night for the purpose of these instructions, for the purpose of providing the warning signs.

Excavation liable to cause danger to vehicles or the public must at all times be protected with fencing of rope tied to strong uprights or bamboo poles at suitable height or by some other effective means. Any such temporary erection which is likely to cause obstructions and which is not readily visible should be marked by posts carrying red flags or boards with a red background by day and by continuously lighted lamps at night.

The flags and the lamps should be placed in conspicuous positions so as to indicate the pedestrians and drivers of vehicles the full expanse i.e. both width and length of the obstruction. The distance between lamps or between floors should not generally exceed 1.25 m along the width and 6m along length of the obstruction in non-congested areas, but 4 meters along the length in congested areas.

If the excavation is extensive, sufficient notice to give adequate warning of the danger, should be displayed consciously not less than 1.25 m above the ground and close to the excavation. Where any excavation is not clearly visible for a distance of 25m to traffic approaching from any direction or any part of the carriage way of the road in which the excavation exists, a warning notice should

be placed on the kerb or edge of all such roads from which the excavation or as near the distance as is practicable but not less than 10 m from the junction of an entering or intersecting road in which the excavation exists. All warnings, in these should have a red background and should be clearly visible and legible. All warning lamps should exhibit a red light, but white lights may be used in addition to facilitate working at night. Wherever required a passage for pedestrians with footbridge should be provided. At excavations, cable drums, tools and all materials likely to offer obstructions should be properly folded round and protected. This applies to jointer's tents as well. Leads, hoses etc. stretched and across the carriageway should be guarded adequately for their own protection and also that of the public.

Traffic Control

The police authorities are normally responsible for the control of traffic and may require the setting up of traffic controls to reduce the inconvenience occasioned by establishment of a single line of traffic due to restriction in road width or any other form of obstruction caused by the work. As far as possible, such arrangements should be settled in advance. If there are any specific regulations imposed by the local authorities, these should be followed.

Work along Railway Lines

Normally all works at Railway crossing is to be done under supervision of the railway authorities concerned, but it is to be borne in mind that use of white, red or green flags by the Departmental staff is positively forbidden to be used when working along a railway line as this practice may cause an accident through engine drivers mistaking them for railway signals. When working along double line of railway, the men should be warned to keep a sharp look on both the "UP" and' DOWN" lines to avoid the possibility of any accident when trains pass or happen to cross one another near the work spot.

Procedure and Safety Precautions for use of explosives during blasting for trenching

In areas where the cable trench cannot be done manually on account of boulders and rocks, it is necessary to blast the rocks by using suitable explosives. The quality of explosive to be used depends on the nature of the rocks and the kind of boulders. A few types of explosive fuses and detonators normally used for making trenches for cable works are detailed below:

Gun powder
Nitrate Mixture
Gelatine
Safety fuse
Electric Detonator
Ordinary Detonator

Procedure

A detailed survey of the route is to be done to assess the length of the section where trenching is to be done with the help of blasting. A route diagram of the rocky section may be prepared

indicating the length of the route where the explosives are to be used. For the purpose of obtaining license, a longer length of route should be given in the application as in many cases, after digging, rocks appear which was not initially anticipated.
Next a license will have to be obtained for use and storing of explosive in that section. If the area falls under a police commissioner, the authority for granting such license is the police commissioner of the concerned area. When the route does not fall in the jurisdiction of a police commissioner, the authority for issuing license is the District Magistrate.
The concerned State/SIA authority should be applied in prescribed form with a route map. The concerned authority will make an enquiry and issue license for using/storing explosives for cables trenching work. Such license will be valid for 15 days only. The license should be got renewed if the blasting operation needs to be extended. Once the license is granted, it is the responsibility of the holders of the license for the proper use of explosives, its transportation and storing.

Method of using
The safest explosive is the Gelatin and electric detonator. Gelatin is in the form of a stick. Electric detonator is a type of fuse used for firing the explosive electrically. Holes are made at suitable intervals on rocky terrain or boulders either by air compressor or by manual chipping. The depth of the holes should be 2 to 3 ft. Fill up the holes with small quantity of sand for about 6". First the electric detonator is to be inserted into the Gelatin and the Gelatin is to be inserted into the holes keeping the + ve and - ve wirings of electric detonators outside the holes. Again refill the holes with sand. These +ve and-ve insulated wires of detonator are than extended and finally connected to an EXPLODER kept at a distance of not less than 100 m.
Now the explosive is ready for blasting. But, before connecting wires to exploder for blasting, all necessary precautions for stopping the traffic, use of red flags, exchange of caution signals, etc. should be completed and only then Exploder should be connected and operated.

Operation of exploder (IDL schaffler type 350 type exploder)
The type 350 blasting machine consists of a bearing block with blasting machine system and the explosion proof light- alloy injection moulded housing. The exploder is held with the left hand. The twist handle is applied to the drive pin, clapped with the right hand turned in the clock wise direction in continuous measurements at the highest speed from the initial position until it reached to a stop. At this stage an indication lamp will glow. When the indication lamp glows, "press button switch" should be pressed. This will extend the electric current to detonator and Gelatin will be detonated. The rock will be blasted out of the trench. Number of holes can be blasted in a single stroke by connecting all such detonators in series connection and finally to the exploder. After blasting, again mazdoors are engaged on the work to clear the debris. It the result of the first blasting is not satisfactory, it should be repeated again on the same place.

Warning
There may be two reasons for unsatisfactory results of the blasting
Misfire of Gelatin due to leakage of current from detonator.
Over loading because of overburdens.

Never pull the broken wire pieces form the holes in such cases. Attempt should not be made to reblast the misfired Gelatin. The safest way is to make a fresh hole by its side and put fresh Gelatin in that hole and blast it.

Precautions

The abstract of Explosives Rules 1983 which are relevant to our work is given below:
Restriction of delivery and dispatch of explosives

No person shall deliver or dispatch any explosives to anyone other than a person who is the holder of a license to possess the explosives or the agent of a holder of such a license duly authorized by him in writing on his behalf? OR
Is entitled under these rules to possess the explosives without a license.

The explosives so delivered or dispatched shall in no case exceed the quantity, which the person to whom they are delivered or dispatched is authorized to possess with or without a license under these rules.
No person shall receive explosives form any person other than the holder of a license granted under these rules. No person shall receive from or transfer explosives to any person for a temporary storage or safe custody in a licensed premise unless prior approval is obtained from the Chief Controller.
A person holding license for possession of explosives granted under these rules shall store the explosives only in premised specified in the license.

Protection from Lightening During Storing

Every magazine shall have attached there to one or more efficient lightening conductors designed and erected in accordance with the specification laid down in Indian Standard Specifications No.2309 as amended from time to time. The connections to various parts of earth resistance of the lightening conductor terminal on the building to the earth shall be tested at least once in every year by a qualified electrical engineer or any other competent person holding a certificate of competency in this behalf from the State Electricity Department. A certificate showing the results of such tests and the date of the last test shall be hung up in conspicuous place in the building.

Precautions during thunder-storm

When a thunder- storm appears to be imminent in the vicinity of a magazine or store house every person engaged in or around such magazine and store house shall be withdrawn to a safe distance from such magazine or store house and the magazine and store house shall be kept closed and locked until the thunder storm has ceased or the threat of it has passed.

Maintenance of records

Every person holding a license granted under these rules for possession, sale or use of explosives shall maintain records in the prescribed form and shall produce such record on demand to an Inspection Officer.

Explosives not to be kept in damaged boxes

The licensee of every magazine or store house shall ensure that, the explosives are always kept in their original outer package. In case, the outer package gets damaged so that the explosive contained therein cannot be stored or transported, such explosives shall be repacked only after the same are examined by controller of explosives.

Storage of explosives in excess of the licensed quantity

The quantity of any kind of explosives kept in any licensed magazine or store house shall not exceed the quantity entered in the license against such kind of explosives. No explosives in excessof the licensed quantity shall be stored in the magazine or store house unless a permit in this behalf is obtained from the licensing authority by a letter or telegram.

Precautions to be observed at Site

The electric power at the blasting site shall be discontinued as far as practicable before charging the explosives. No work other than that associated with the charging operations shall be carried out within 10 meters of the holes unless otherwise specified to the contrary by the licensing authority.
When charging is completed, any surplus explosive detonators and fuses shall be removed from the vicinity of the hole and stored at a distance which should prevent accidental detonation in the event of a charge detonating prematurely in any hole. The holes which have been charged with explosive shall not be left unattended till the blasting is completed. Care shall be taken to ensure that fuse or wires connected to the detonation are not damaged during the placing of stemming materials and tamping.

Suitable warning procedure to be maintained

The licensee or a person appointed by the licensee to be in charge of the use of explosives at the site shall lay down a clear warning procedure consisting of warning signs and suitable signals and all persons employed in the area shall be made fully conversant with such signs and signals.

Precautions to be observed while firing

The end of the safety fuse (if used in place of a detonator should be freshly cut before being lighted. The exploders shall be regularly tested and maintained in a fit condition for use in firing. An exploder shall not be used for firing a circuit above its rated capacity. The electric circuits shall be tested for continuity before firing. All persons other than the shot-firer and his assistant, if any, shall be withdrawn from the site before testing the continuity.

For the purpose of jointing, the ends of all wires and cables should have the insulation removed fora maximum length of 5 cm. and should, then be made clear and bright for a minimum length of 2.5 cm. and the ends to be joined should be twisted together so as to have a positive metal contact. Then these should be taped with insulation to avoid leakage when in contact with earth. In case of blasting with dynamite or any other high explosive, the position of all the bore holes to be drilled shall be marked in circles with white paint. These shall be inspected by the PIA's agent. Bore holes shall be of a size that the cartridge can easily pass down. After the drilling operation, the agent shall inspect the holes to ensure that drilling has been done only at the marked locations and no extra hole has been drilled. The agent shall then prepare the necessary charge separately for each bore hole. The bore holes shall be thoroughly cleaned before a cartridge is inserted. Only cylindrical wooden tamping rods shall be used for tamping. Metal rods or rods having pointed end shall never be used for tamping. One cartridge shall be placed in the bore hole and gently pressed but not rammed down. Other cartridges shall then be added as may be required to make up the necessary charge for the bore hole. The top most cartridge shall be connected to the detonator which shall in turn be connected to the safety fuses of required length. All fuses shall be cut to the length required before being inserted into the holes. Joints in fuses shall be avoided.

Where joints are unavoidable, a semi-circular niche shall be cut in one piece inserted into the niche. The two pieces shall then be wrapped together with string. All joints exposed to dampness shall be wrapped with rubber tape.

The maximum of eight bore holes shall be loaded and fired at one occasion. The charges shall be fired successively and not simultaneously. Immediately before firing, warning shall be given and the agent shall see that all persons have retired to a place of safety. The fuses of the charged holes shall be ignited in the presence of the agent, who shall see that all the fuses are properly ignited.

Careful count shall be kept by the agent and other of each blast as it explodes. In case all the charged bore holes have exploded, the agent shall inspect the site soon after the blast but in case of misfire the agent shall inspect the site after half an hour and mark red crosses (X) over the holes which have not exploded. During this interval of half an hour, nobody shall approach the misfired holes. No driller shall work near such bore until either of the following operations has been done by the agent for the misfired boreholes.

The PIA's agent shall very carefully (when the tamping is a damp clay) extract the tamping with a wooden scraper and withdraw the primer and detonator.

The holes shall be cleaned for 30 cm of tamping and its direction ascertained by placing a stick in the hole. Another hole shall then be drilled 15 cm away and parallel to it. This hole shall be charged and fired. The misfired holes shall also explode along with the new one.

Before leaving the site of work, the agent of one shift shall inform the agent relieving him for the next shift, of any case of misfire and each such location shall be jointly inspected and the action to be taken in the matter shall be explained to the relieving agent. The State/SIA shall also be informed by the agent of all cases of misfire, their cause and steps taken in that connection.

General Precautions

For the safety of persons red flags shall be prominently displayed around the area where blasting operations are to be carried out. All the workers at site, except those who actually ignite the fuse, shall withdraw to a safe distance of at least 200 metre from the blasting site. Audio warning by blowing whistle shall be given before igniting the fuse.
Blasting work shall be done under careful supervision and trained personnel shall be employed. Blasting shall not be done within 200 meters of an existing structure, unless specifically permitted by the State/SIA in writing.

Precautions against misfire

The safety fuse shall be cut in an oblique direction with a knife. All saw dust shall be cleared form inside of the detonator. This can be done by blowing down the detonator and tapping the open end. No tools shall be inserted into the detonator for this purpose. If there is water present or if the borehole is damp, the junction of the fuse and detonator shall be made water tight by means of tough grease or any other suitable material. The detonator shall be inserted into the cartridge so that about one-third of the copper tube is left exposed outside the explosive. The safety fuse just above the detonator shall be securely tied in position in the cartridge. Waster proof fuse only shall be used in the damp borehole or when water is present in the borehole. If a misfire has been found to be due to defective fuse, detonator or dynamite, the entire consignment from which the fuse, detonator or dynamite was taken shall be got inspected by the State/SIA or his authorized representative before resuming the blasting or returning the consignment.

Precaution against stray currents

Where electrically operated equipment is used in locations having conductive ground or continuous metal objects, tests shall be made for stray current to ensure that electrical firing can proceed safely.
Horizontal Directional Drilling (HDD)

HDD Overview :Horizontal directional drilling is an excellent alternative to traditional utility installation methods. Unlike manual labor, trenching or excavation, the HDD process is highly suitable in urban areas or places where aboveground obstructions exist that are expensive, inconvenient or impossible to disturb for product installation. HDD machines install utilities under obstacles such as roads, rivers, creeks, buildings and highways — with little or no impact to the aboveground surface.

Drill Rig : Horizontal directional drilling machines are available in many sizes. Regardless of a machine’s size, it has three main functions — rotation, forward thrust/pullback and fluid flow.

HDD Process :Horizontal directional drilling machines will bore under or around obstacles. Once the drill path is planned, an underground pilot bore is performed utilizing a series of drill rods connected to a drill head. After the pilot bore is completed, a back reamer is attached to the drill string that enlarges the drill path to accommodate the product that will subsequently be pulled into

place. Vermeer NAVIGATOR horizontal directional drilling machines can install product under roads, buildings, railroad tracks, streets, rivers, creeks and in congested underground areas.

Steering :Steering refers to control of the direction of a drill path. The shape of a drill bit on the drill head allows an operator to change the drill path direction during a bore. When an operator points the drill bit downward to the 6 o'clock position and pushes the drill head forward, the drill head goes deeper. When the drill faces the 12 o'clock position, the drill head will rise. Pushed to the 9 o'clock position, the head goes left. Pushed to the 3 o'clock position, the head goes right. If no change in drill path is needed, the drill head and rod are rotated while thrusting.

Locating :Prior to starting a bore, the drill head is equipped with a transmitter that sends signals to an aboveground receiver during the bore. The drill head's location must be tracked during a bore in order to provide steering position information to the HDD operator.

ALLIED ACTIVITIES

Storing/Warehousing of Materials: PIA will be responsible for storing and warehousing of all the material and accessories, but not limited to, supplied by him at his own cost. No storing/warehouse shall be provided by State/SIA.

Transportation of Materials: The PIA shall be responsible for transporting the materials, to be supplied by the GFGNL or otherwise to execute the work under the contract, to site at his/ their own cost. The costs of transportation are subsumed in the standard quoted Rates and therefore no separate charges are payable on this account. After the Go-Live and traffic migration, one time dismantling, proper packaging and transpotation shall be in scope of bidder without any additional cost to GFGNL. The location will be conveyed by the GFGNL at the time of transportation.

Disposal of Empty Cable Drums: The PIA shall be responsible to dispose of the empty cable drums after laying of the cables. The cost of various sizes of empty cable drums recoverable from the PIA will be fixed taking into account the prevailing market rates.

It shall be obligatory on part of the PIA to dispose of the empty cable drums at his/their level and the amount fixed for various empty cable drums shall be recovered from the bill for the work for which the drum (s) was/were issued or from any other amount due to the PIA or the Security Deposit.

The PIA shall not be allowed to dump the empty cable drums in Govt. /Public place which may cause inconvenience to the GFGNL / public. If the PIA does not dispose of the empty cable drums within 3 days of becoming it empty, the GFGNL shall be at liberty to dispose off the drums in any manner deemed fit and also recover the amount fixed in this contract from the bill/security deposit/ any other amount due to the PIA.

Supply of Materials: There are some materials (Accessories) other than as mention in BoQ required to be supplied by the PIA for execution of work under this contract like Bricks, Cement,

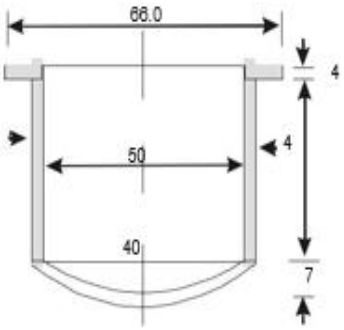
Wire Mesh and Steel for protection, etc., besides using other consumables which do/don't become the part of the asset. The PIA shall ensure that the materials supplied are of best quality and workmanship and shall be strictly in an accordance with the specifications.

Social auditing: While carrying out the execution work of cable/Eqpt. ,videography may be carried out on sample basis for duration of 15 to 30 minutes per Gram Panchayat which may also involve the local people of the Gram Panchayats and villages including the Gram Panchayat Pradhan (If possible) and same may be submitted in a form of CD along with the documentation sets for information.
Detail information with completion route may publish in public domain for public/GramPacnhayat feedback, Selected PIA is solely responsible to answer those queries and improve the field and backoffice infrastructure (applicable under this RFP scope) and take acknowledgement from concern authority in written. GFGNL is authorized to do scrutiny on sample basis wherever feasible and if any deviation found,the suitable actions with penalty will be applied to PIA.

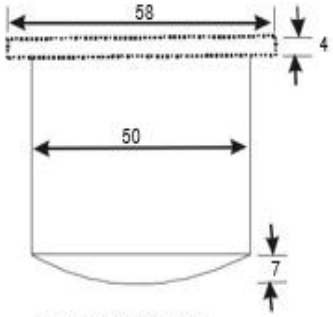
Note: All the materials as above have to be TSEC/Type approved by BSNL QA/TEC against mentioned TEC GR or as per the approval procedure of executing State/SIA for which TEC GR not there.

Figure 1

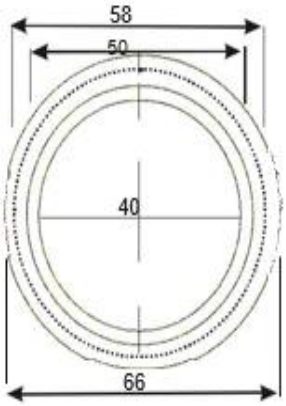
HDPE END CAPS

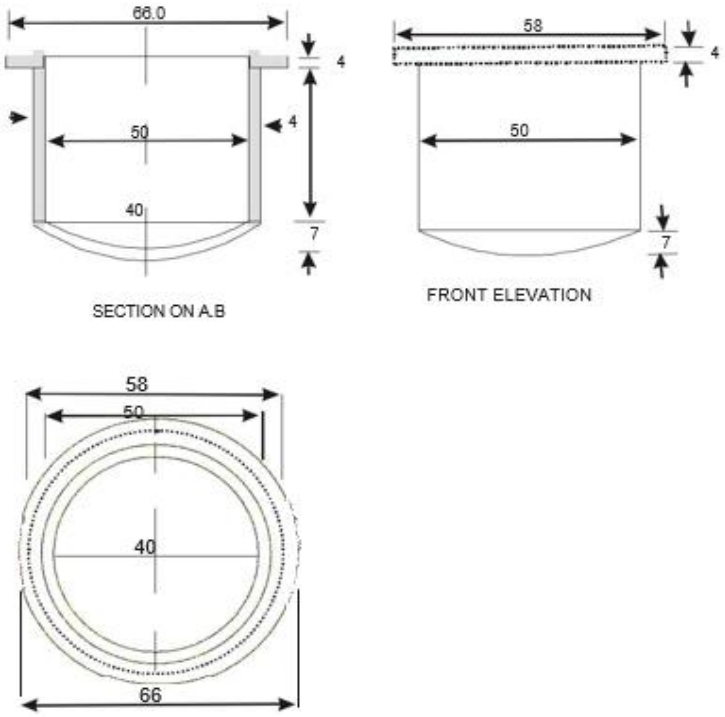


SECTION ON A.B



FRONT ELEVATION




66.0
4
50
4
40
7
SECTION ON A.B
58
4
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7
FRONT ELEVATION
58
50
40
66

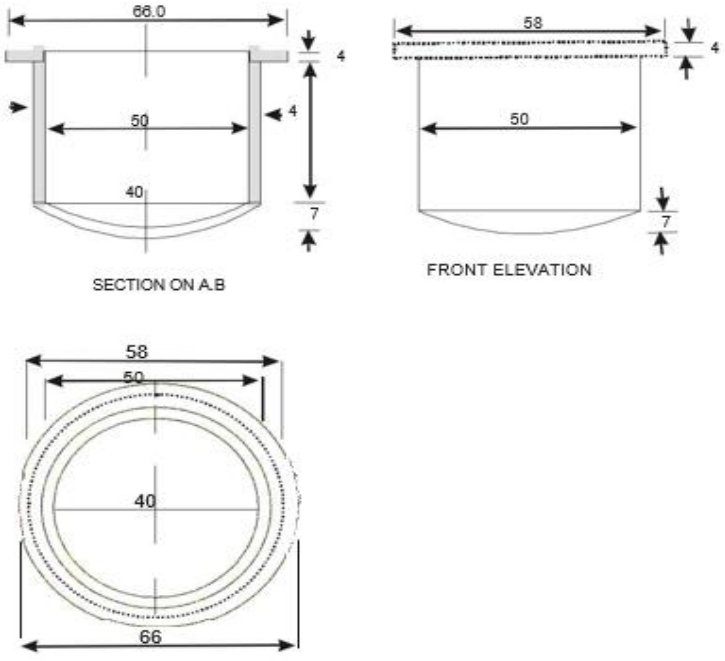
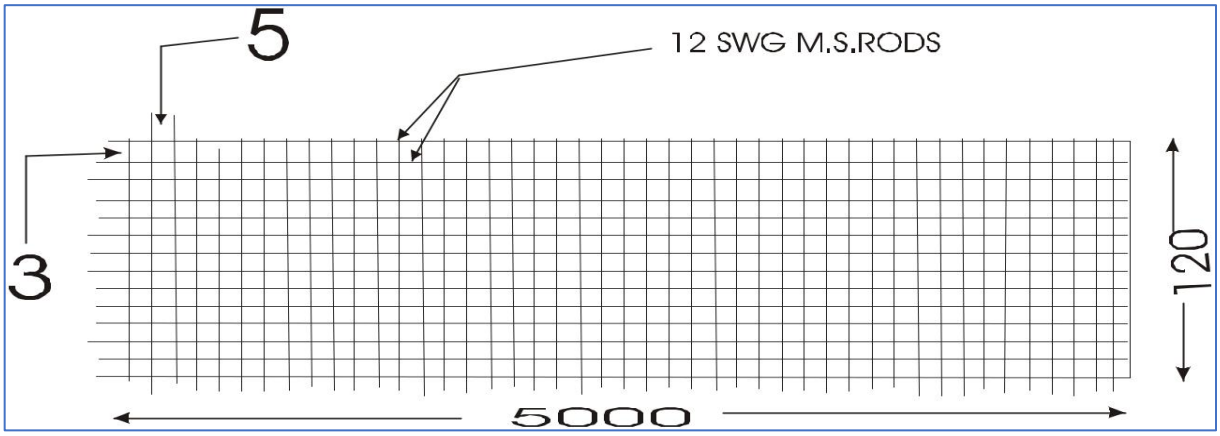

66.0
4
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SECTION ON A.B
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FRONT ELEVATION
58
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Figure2

M.S. WELDMESH

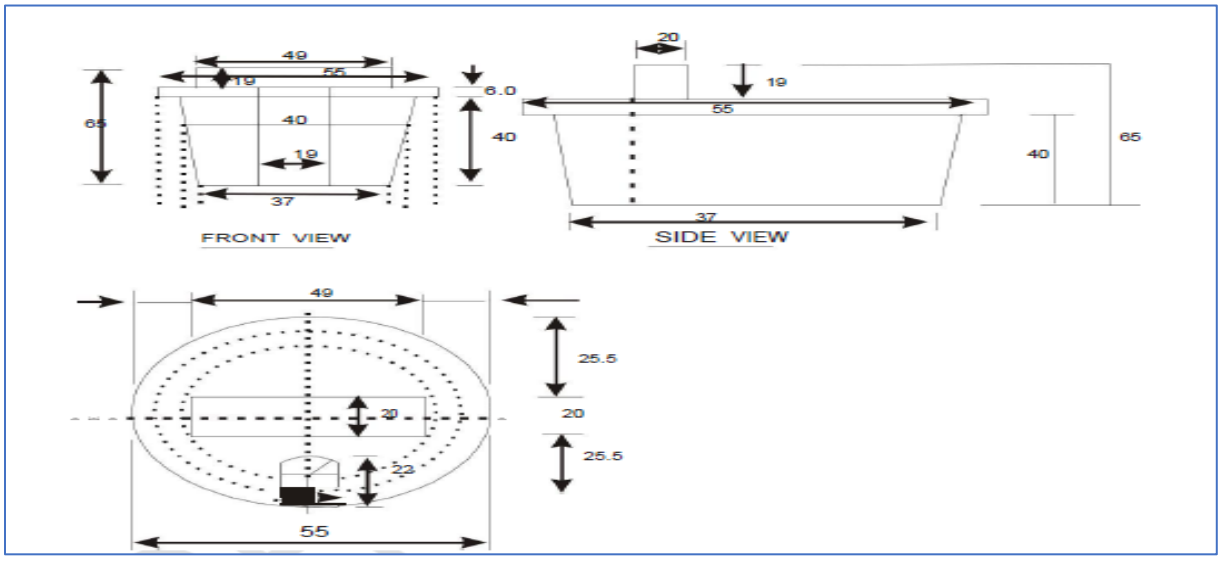
DETAILS OF 100 MM X 50 MM, 12 SWG MILD STEEL WELD MESH HAVING WIDTH OF 120 CM.



Note: All measurements are in centimeters.

Figure 3

Rubber Cork



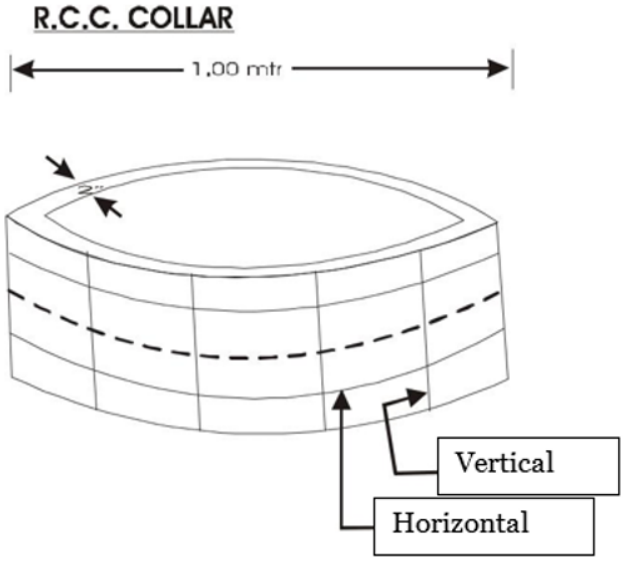
TOP VIEW

Note:

1. All Dimensions are in MM
2. Dimensions are only for guidance. Tapper Should be such that it should tightly fix, into Type A & Type B Hope 50mm OO Pipes.

Figure 4

SPECIFICATION AND REINFORCEMENT DETAILS OFR.C.C. JOINT PROTECTION CHAMBERS



Specifications:

#	Description	Proposed Chamber Specifications
1	Wall Thickness	75 mm
2	Material	RCC
3	Grade	M30
4	Manhole Outer Diameter	1000 mm
5	Manhole Inner Diameter	850 mm
6	Height	1000mm (Single Ring)
7	Shape	Round
8	Crack Resistance	Yes
9	Reinforcement Grade	Fe 415
10	Concrete Grade	M30
11	Top Cover Thickness	100mm
12	Top Cover Diameter	890mm
13	Bottom Cover Thickness	50mm
14	CONCRETING	MIX: 01:02:03
15	HORIZONTAL IRON ROD RING USED	6 MM
16	HORIZONTAL IRON ROD RING USED	4 NOS.
17	VERTICAL BARS IRON	10 MM
18	VERTICAL BARS IRON USED	10 NOS.

Note:

a) Concrete 'Mix. 1: 2:3 (1 Cement : 2 Sand : 3 graded Stone aggregate 20 mm nominal size.

b) Finishing : Smooth

Figure 5

RCC Route Indicator

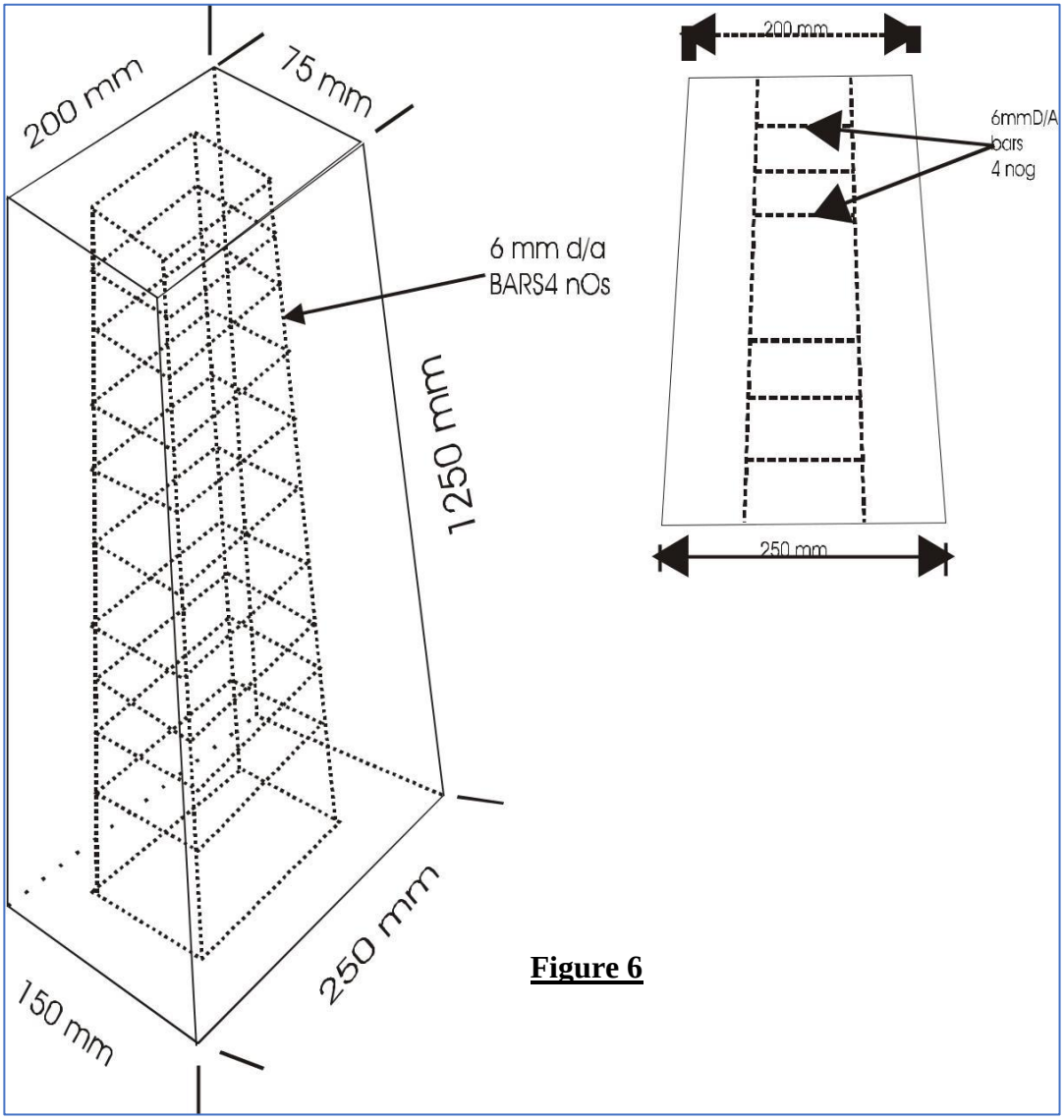
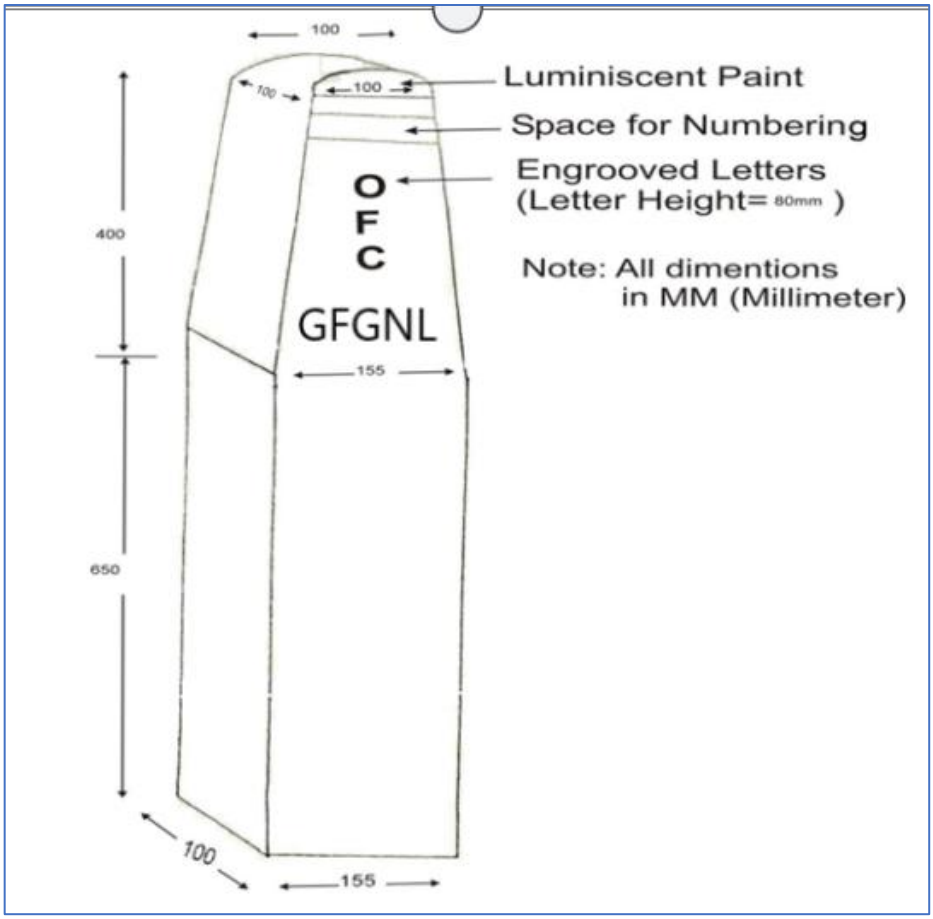


Figure 6

Stone OFC Route Indicator



Abbreviations

Trenching depth under no circumstances shall be less than 30cms. Trenching work in soft/hard rock patches are to be achieved using rock breakers or any other method deemed fit.
The relaxation by the competent authority prescribed below shall be obtained giving reasons for not achieving standard depth;
Duct: Extra 2% of trench length to account for actual PLB length in trenches. The payment shall be made with above factor included. However, ~~As this RFP is EPC,~~ no payment shall be made separately other than payment schedule.
Extra OFC length shall normally be kept @ 20 meter per joint.

Annexure :D INSTALLATION PRACTICE OF SELF SUPPORTING METAL FREE AERIAL OPTICAL FIBRE CABLE

1. Introduction

This engineering Instruction (EI) deals with the guidelines and the installation practice for installing of self-supporting metal free aerial optical fibre cable.

2. General guidelines

2.1 General Instruction for Installation of ADSS :

(a) The methods described in this Engineering Instruction for installation of All Dielectric Self-Supporting (ADSS) fiber optic cable are intended to be used as guidelines by design engineers and outside plant construction personnel. This guide is generic enough, and yet contains sufficient specific information, to be applicable for most installations of ADSS cable, however, local conditions, existing engineering and customer procedures and requirements must be considered.

(b) ADSS Cables should meet National Electric Safety Code (NESC) loading requirements for heavy, medium, and light loading conditions in their sag/tension tables. Special tables can be generated based on specific customer installation requirements, which may include minimum separation and clearance, sag requirements, and loading conditions.

(c) It is assumed that the personnel using the information presented in this document have prior experience in the planning, engineering or placement of ADSS fiber Optic Cable.

(d) The ADSS Cable should meet the P1222 IEEE Standard for All- Dielectric Self- Supporting Fiber Optic Cable (ADSS).

2.2 Precautions during Installation of ADSS :

(a) The following are some suggested precautions which should be observed when working with fiber optic cables. Before starting any aerial fiber optic cable installation, all personnel must be thoroughly familiar with Occupational Safety and Health Act (OSHA) regulations. Each individual company's safety precautions for ADSS fiber optic cable installations should be reviewed before work begins and practiced during the entire installation process.

(b) Before cable installation begins, the cable reels should be carefully inspected for any imperfections such as nails and broken flanges which might cause damage to the cable as it is payed out. Precautions should be taken to protect stored reels from possible damage by vandals or other sources when left unattended.

(c) Fiber optic cable is a high capacity transmission medium which can have its transmission characteristics degraded when subjected to excessive pulling force, sharp bends, and crushing forces. These losses may not be immediately revealed after installation. For these reasons extra care must be taken during the entire installation process.

(d) Whenever cable from the reel is placed on pavement or other surfaces, it should be protected with barricades or cones to prevent possible vehicular or pedestrian traffic damage.

(e) Fiber optic cables are susceptible to performance degradation due to tight bending.
The minimum bend radius of each cable is specified relative to the cable's diameter. During installation a cable not be exposed to a bend radius smaller than 20 times the cable diameter and that after installation a cable should not be exposed to a bend radius smaller than 10 times the cable diameter.

(f) Whenever cable from the reel is placed on pavement or other surfaces, it should be protected with barricades or cones to prevent possible vehicular or pedestrian traffic damage. A "figure-eight" configuration should be used when the cable is removed from the reel and piled on the ground. This prevents kinking and twisting of the cable which could cause damage. Fiber optic cable should not be coiled in a continuous direction except for lengths of 30 meters (100 ft) or less. The preferred sized for the "figure-eight" is about 4.5 meters (15 ft) in length with each loop 1.5 meters (5 ft) to 2.4 meters (8 ft) in diameter.

Note: An alternative to the manual figure-eight is the "figure-eight" machine. This equipment will "figure-eight" cable much faster than manual methods saving time and manpower. Using a "figureeight" machine the remaining cable on the reel is wound on the machine's drum. Once the

inside cable end is accessible, the machine is reversed and the cable is pulled from the machine through the duct. The machine's drum and rollers are designed to keep the cable at a bend radius that exceeds the minimum bend radius of the cable.

(g) Never, during the pull-in process, should the fiber optic cable experience sags, bends or twists that produce in the cable a bend whose radius is smaller than that specified as the minimum bend radius for the cable being installed.

(h) Do not cut the Cable under any circumstances without prior approval of the engineer responsible for the project. Splice locations are determined in the initial system design by the project engineer. Introducing new splices can potentially degrade the transmission characteristics of the system.

(i) Temporary or permanent guys should be installed at any location where the self-supporting cable is tensioned to avoid placing an unbalanced load on the support poles. Wire mesh grips are intended for pulling the cable into place and are not intended for tensioning the cable in place. Do not use split wire mesh grips to tension or to hold cable under tension.

2.3 Accessories and tools for Installation of ADSS :

(a) The type and construction of the reel support determines the method and tools for handling. Reel construction requires that they be mounted on an axle or be supported by the reel flange. The equipment used must be rated for the maximum load and be able to lift the reel. When the reel stand is not self-loading, a crane, forklift or some other method of lifting must be available to lift the reel onto its stand.

(b) The reel support design employed must incorporate an adjustable brake to supply the necessary hold-back tension needed to properly tension the cable. The cable may be pulled directly from the reel support when employing slack stringing methods that apply minimal tension to the reel of cable.

(c) Capstan and reel type pulling machines with approved adjustable tensioners may be used to install the ADSS fiber optic cable.

(d) The pulling and braking system employed should operate smoothly to prevent any jerking or bouncing of the cable during placement. The system should be controllable and able to maintain a constant and even tension on the cable during the installation process. Pullers and tensioner should be equipped with tension indicator and limiting devices. Tensioner wheels

should be controlled so that a constant hold-back tension is maintained at all pulling speeds. A braking system to maintain cable tension when pulling is stopped is required.

(e) Sheave diameters larger than those specified in Paragraph 2.5 are suggested, especially at the payoff reel position and the take-up or winch location. A larger diameter than the minimum diameter required offers the advantage of reducing the load applied to the cable.

(f) The depth and flare of grooves in wheels used during the placing process are not critical, but there are some recommended guidelines that should be followed. The sheave grooves should have depth of 25% greater than the cable diameter with a flare angle of 15 to 20 degrees from vertical. This will facilitate the passage of grips, swivels, etc. and contain the cable within the groove. The material and finish of the grooves should be such that it does not mar the surface of the cable.

(g) Traveler, sheave, or quadrant blocks used should be in good working order and properly lubricated. The cable release should work smoothly with minimal pressure. These should be lined so that they do not cause any abrasion of the cable jacket. A plastic lining of neoprene or urethane are acceptable.

(h) Tangent supports made of metal with a protective pad can be used as a replacement for stringing blocks. These supports are mounted directly on the pole and open from the top. The protective pads can be removed and the top closed and secured for stringing.

(i) At places where uplift may occur, it is recommended that uplift rollers or hold down blocks be used.

(j) Wire mesh grips or pulling eyes can be used to pull the cable into place through the travelers, sheaves, or quadrant blocks. The mesh grip or pulling eye must be used in conjunction with a swivel link which will minimize cable twisting that can be introduced by the pull rope. The load rating of the swivel link shall not exceed the maximum pulling tension rating of the cable.

2.4 ADSS Installation Methods:

There are two primary method used for placing ADSS cable. Both these methods are very similar to those methods used to place most aerial cables. The first method is called the stationary reel, or the “Pull-back Method,” and the second is called the moving reel, or the “Drive-out Method.”

The Pull-back Method: The Pull-back Method is illustrated in Figure A below.

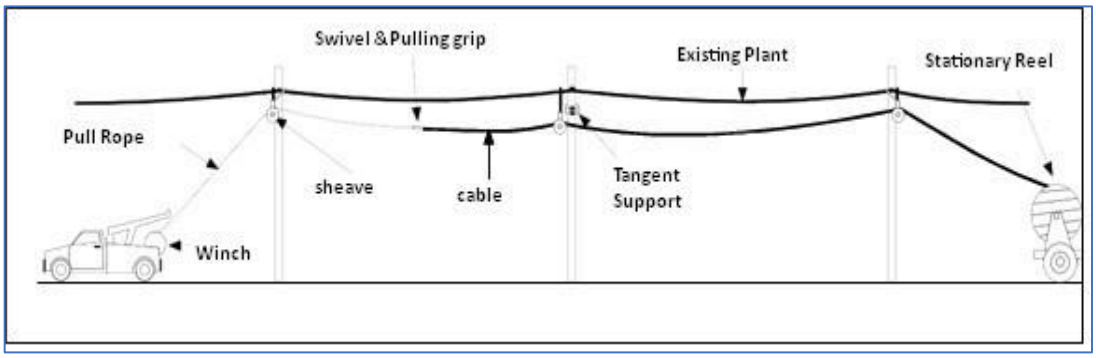


Figure A: The Pull-back Method of Installation of ADSS

(a) Holes are drilled in all poles along the cable run and line pole hardware is attached to the poles at the engineered height. At dead-end and tangent locations, down guys are placed at the correct position according to local engineering practices.

(b) Travelers, sheaves, or quadrant block are placed just above or just below the location of the installed pole line hardware at each pole location. The diameter of these supports must meet the minimum bend radius specs for the cable in any location where the cable will be bent more than 20 degrees. The cable warranty is void if these limits are not observed.

(c) Please note that if tension is let off the cable during a pull, the natural sag of the cable will usually produce angles larger than 20 degrees at each support point. Thus, extreme caution must be used if pulling through small diameter supports.

(d) The pulling line is then pulled through each traveler, sheave, or quadrant block. After the pulling line is in place, it is attached to the ADSS cable with a break-away swivel and a factory installed pulling eye. A wire mesh grip may be used when a pulling eye has not been installed.

(e) The ADSS cable is then pulled in through the entire section using the puller and the tensioner. Care must be taken to avoid over tensioning the cable and to avoid sagging of the cable that may introduce bends that are smaller than the minimum bending

radius of the cable. Several pulling stages may be required to place the cable through the entire system.

(f) When the entire cable has been pulled into place, starting at an end location, each dead-end to dead-end cable length can be sagged and tensioned and support hardware applied according to the installation requirements.

The Drive-back Method : The Pull-back Method is illustrated in Figure B below.

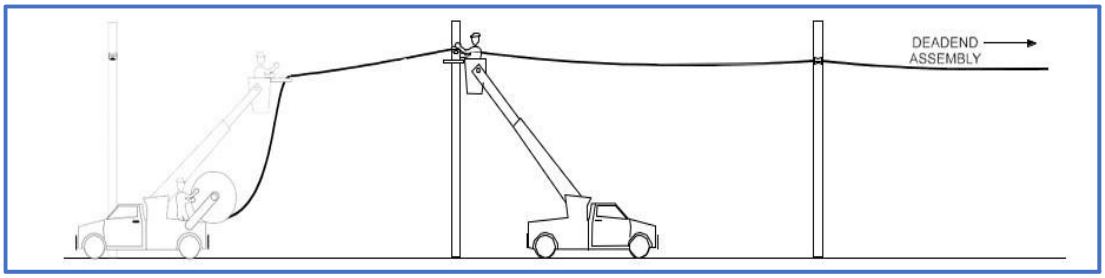


Figure B: The Pull-back Method of Installation of ADSS

(a) The Drive-out method of cable placement is primarily used during the construction of new lines where there is a clear right-of-way and with no obstructions to vehicles.

(b) The reel of cable is placed on a reel trailer or a truck equipped with a reel carrier. The cable should play off the top of the reel for reel trailers and the bottom of the reel for trucks equipped with a reel carrier. The reel trailer or reel equipped truck should have a braking device, set on minimum. The brake is used to prevent overrun of the reel when stopping at the support poles.

(c) Holes will have to be drilled at the poles to mount the support hardware. At dead-end and tensioning locations, down-guys of the correct loading factor at to be placed according to local engineering practices.

(d) Travelers, sheaves, or quadrant blocks are placed above or below the pole mounting hardware at each pole location.

(e) With the cable dead ended at the starting location and minimum tension applied to the reel brake, the reel of cable is transported along the construction route while the cable is played out.

(f) As the reel passes a pole location, the trailer or truck must be stopped while the cable is placed into the traveler, sheave, or quadrant block attached to the pole.

(g) The reel then travels on to the next pole where the process is repeated over again. This continues until the cable is completely deployed or a deadend is reached.

(h) With the cable deployed, each span must be sagged and tensioned with supporting hardware installed. Each span is started at the deadend and slack worked back towards the opposite end. An alternative method is to sag and tension each span and install permanent hardware as the cable is being deployed.

2.5 Route Survey:

The route should be inspected before the actual installation of optical fibre cables. Survey of the aerial route should be carried out pole by pole.

2.6 Over Head Alignment:

The existing route alignment wherever available should be used. On new routes, alignment should be erected. The span length must not exceed above 90 metres.

2.7 Line Diagram:

(a) A line diagram should be prepared to mark the poles & the actual distance between the poles in a splice section (Normally 15 poles per km are recommended).

(b) Additional poles should be erected if required to keep the span length within the specified limits.

(c) Care should be taken that the alignment is easily accessible from the road. It is necessary to keep a clear head way (Ground clearance) of 12 to 15 feet in a section.

(d) A complete line diagram should be prepared i.e. from station A to station B.

(e) The number of road crossings, canals or nallahs, electric lines should be clearly marked in the route diagram.

2.8 Hilly Regions:

(a) Line erection rules must be strictly followed. Additional poles may be erected for better support to optical fibre cable & to avoid sharp curves & bends.

(b) Span lengths should be reduced to avoid sags in case of steep slopes.

3. Installation of ADSS on New poles

3.1 Tension Poles

Tension poles are dead end or termination poles. The tension poles shall have dead end fittings. The dead end fittings offer a continuous run of the aerial optical fibre cable. These fittings relieve the optical fibre cable of its compressive, bending & clamping stresses. The performed dead end fittings are suitably gritted for excellent tensile holding strength.

3.1.1 Selection of Tension Poles

Selection of tension poles depends upon the actual site location of the route. Every fifth pole should be a tension pole in straight alignment. Splicing location poles should

be tension poles or wherever alignment takes a sharp turn (more than 15 degrees) should also be a tension pole.

3.2 Suspension Poles

The suspension pole assembly is designed to offer cushion to aerial optical fibre cable against the dynamic stress of Aeolian vibration at the suspension point. They also reduce static stresses at the Support point.

3.3 Selection Poles

Selection of suspension poles also depends upon actual site location of route. All the intermediate poles between two tension poles will be suspension poles.

3.4 Selection of Splice location

The splice box of the aerial optical cable should be buried underground. Therefore it is necessary to fix & determine the splicing location as per the designated cable drum length.

3.5 Aerial optical Fibre Cable Specifications

1.	Maximum span length	:	90 metres (Amendment No. 12.7)
2.	Maximum ice loading	:	1 Kg per meter
3.	Operational wind velocity	:	75Kms per hour
4.	Maximum sag allowed	:	2% of span length

5. (without excess load) Maximum sag allowed :

3% of span length

6. (with excess load) Temperature range :

- operation & storage : -30 to +70 degree C
- installation : -15 to +50 degree C

7. Minimum bend radius : 2D (D-Dia of cable)

8. Tensile force

During installation : Permanent with ice & wind load: 9.81 x 1.3 x w

9.81 x 3 x w

(where w is the mass of 1 km length of cable, in kg)

3.6 Type of Accessories and Fixtures

3.6.1 FORMED OFC DEAD END AND TERMINATION FITTINGS:

These fittings are used at tension/termination poles (dead end poles), or poles where splices are located and the poles where the overhead alignment takes a turn, (angle exceeding more than 15 degrees) as shown in fig. 1.

(a) J-SHAPED TENSION HOOK

J - Shaped tension hook is for the installation on cross arm channel C (C-Bracket) of the poles as shown in fig. 2.

(b) TURN BUCKLE

Galvanized forged steel turn - buckle is used at the dead end and at tension positions (for adjusting the sag & tension) as shown in fig. 3.

(c) EXTENSION LINK:

Galvanized steel extension link is used along with turn buckle as shown in fig. 4.

(d) CLEVIS THIMBLE:

Aluminium alloy die cast thimble is used to attach the extension link and for accommodating the loop of the helically formed terminating helix at the other and its smooth internal contour as shown in fig.5.

(e) PROTECTIVE HELIX (T):

Set of aluminium alloy helically formed protective helix having predetermined spiral shape is used & making them conveniently applied on the optical fibre cable without excessive clamping pressure at any point. See fig. 6.

(f) TERMINATING HELIX:

Helically formed terminating helix of Aluminized steel having a prefabricated loop shall be to fit into the grooved contour of the thimble and for fixing over protective helix over the optical fibre cable. See fig. 7.

(g) JUMPER CABLE CLAMP:

Galvanized steel jumper cable clamp is used to support the through length of optical fibre cable at the intermediate tension poles as shown in fig. 8.

(h) POLE MOUNTED STAY CLAMP (TUBULAR) OR POLE MOUNTED STAY CLAMP (RAIL)

Galvanized mild steel pole mounted stay clamp should be used at the pole for the fixing with a twisted eye & turn buckle; see figs. 9 & 10.

The selection of the type of stay clamp will depend upon the type of poles.

3.6.2 OFC SUSPENSION FITTINGS:

Helically formed suspension fittings along with the elastomeric pads inserts strapped by a galvanized steel eye-band is used to hang from the twisted eye-link connected to a pole mounted stay clamp or on the tension hook (J-shaped) installed on the C bracket at the intermediate poles as shown in fig. 11.

(a) TIWSTED EYE LINK:

The twisted eye link is used for installing suspension fitting on stay clamp or on tension hook as shown in fig. 12.

(b) PROTECTIVE HELIX (S)

Set of aluminium alloy helically formed protective helix having predetermined spiral shape is used & making them conveniently applied on the optical fibre cable without excessive clamping pressure at any point. See fig. 13.

(c) ARMOUR GRIP HELIX:

Set of aluminium alloy armour grip helix is used or fixing on the profile shaped elastomer pad for proper strut action, grip & bird caging as shown in fig, 14.

(d) SUSPENSION CLIPPER WITH ELASTOMER PAD:

Set of suspension clipper (made of aluminium alloy permanent mould die cast split type clamp) is used to support the elastomer pad inserts & is strapped by a galvanised steel eye-band in order to hang from a twisted eye-link connected to a pole mounted stay clamp or tension hook as shown in fig. 14.

(e) SPIRAL VIBRATION DAMPER (SVD)

Helically formed spiral vibration dampers are used on both sides of suspension fittings as shown in fig. 15.

3.6.3 DEMOUNTABLE PULLEY:

Demountable pulleys are used during the installation of aerial optical fibre cables see fig.16.

These are made from mild steel & the contour of the wheel is coated with rubber or any other suitable material for free movement of cable.

3.6.4 MATERIAL REQUIREMENT OF INSTALLATION ACCESSORIES AND FIXTURES:

(a) FOR DOUBLE TENSION POLES:

1. DESCRIPTION

J-shaped tension hook QUANTITY 2

2. (For C-bracket) Turn buckle

2

3. Extension link 2
4. Clevis thimble 2
5. Protective helix (T) 2 sets
6. Terminating helix 2 sets
7. Jumper cable clamp
8. a) Pole mounted stay clamp(Tubular) 1 (Pole having C-bracket)
   b) Pole mounted stay clamp (Tubular) bracket) 2(Pole without C-

OR

a) Pole mounted stay clamp (Rail) 1(Pole having C- bracket)

b) Pole mounted stay clamp (Rail) 2 (pole having C-bracket)

(b) FOR SUSPENSION (INTERMEDIATE POLES)

DESCRIPTION QUANTITY

a) Pole mounted stay clamp (Tubular)

b) Pole mounted stay clamp

(Tubular) 7

OR

a) Pole mounted stay clamp (Rail)

b) Pole mounted stay clamp (Rail)

Twisted eye link 1 set

Suspension clamp consisting of the following:

otective Helix (S) 1 set

mour grip helix

spension clipper with elastomer pad etc. 1 set iral vibration damper

haped tension hook 1 (Pole with C-bracket) mountable pulley One per pole in the splice section

Note: The ADSS accessories to be used shall be Helix type-I as per GR.no. 87060: ~~2017~~ 2024 for 24 or more fibre, and for 6F Type-III wedge. The type of pole clamp to be used shall depend on type of poles and optical fiber cable used in the network; to ascertain the required SLA. However, cable selection is in bidder's scope. So, bidder can meet the TEC-GR of respective cable which are being chosen.

3.7 ENTRY OF THE O.F. CABLE IN THE BUILDING:

Normal methods for leading in and precautions recommended for leading-in of the optical fibre cable should be followed. A conduit pipe should be laid for leading-in the
O.F. cable inside the building; the cable may also be taken directly from the nearby
O/H pole to inside of the building for termination.

(a) Before the installation the O.F. cable should be tested.

(b) As per requirement install the additional new poles.

(c) Each pole should be checked for its strength. Provide extra stays if more strength is required.

(d) The Aerial O.F. Cable is recommended to be installed on the outermost hole of bracket towards road on the existing bracket/new bracket on the poles.

(e) Replace weak and other poles for clear ground clearance and strength as per the field conditions.

(f) Provide ground clearance of 12 feet in non-obstructing areas.

(g) Raise the height to minimum 16 feet at all the road crossings.

(h) Maintain the alignment as straight as possible.

(i) Construct splice chambers.

3.8 SPLICE LOCATIONS:

The field splices should be buried underground. The cable should be brought down through a 40mm dia GI pipe clamped on the pole. Proper bends (120-135 degree) are recommended for negotiating the bend. Wooden/hard rubber bushes shall be used at the entry and exit points of the GI pipe to avoid damage to the cable. A splice chamber as per the standard practice shall be made. The selection of the splice point shall depend upon the availability of space and the cable length. Wherever, burying of splice closure is not possible, the same be installed on the poles with proper clamping with the approval of GFGNL.

3.9 CALCULATION OF SECTION LENGTH:

Aerial O.F. cable is supplied as per TEC GR in a length of 2 Kms + 10%.
To arrive at the section length and allocating a particular reel of the cable to a particular section following consideration are required.

Strength Length:

- Actual section length measured.

- Allowance for sag 2% for each span length.

- Cable at each through tension pole (4 meters).

- Extra spare cable for coiling at the splice location (10 meters).

3.10 INSTALLATION MATERIAL REQUIRED DURING INSTALLATION

1. Demountable pulleys : 1 each for each pole in the installation section

2. Jack for cable drum : 1 set
3. Ladders : For each pole
4. Tools : Screw drivers C&T pliers Spanner set & hammer etc.

5. Manila rope 12 mm dia

6. Cable pulling winch machine

: 250 meters

with tension monitoring device : 1
7. Anti twist device : 1
8. Cable pole fork : 10
9. Flat twin open type cable grip : 2

3.11 INSTALLATION OF AERIAL OPTICAL FIBRE CABLE

The following steps are recommended:

(a) Install the accessories and fixtures as per the requirement of the individual poles it tension and suspension fittings.

(b) Install the demountable pulley on all the poles in the section before pulling the cable.

(c) Keep the cable drum over the jack near the 1st pole at the beginning of the section.

(d) Attach anti twist device and the shackle hook along with the rope to the front and of the cable on pulling eye or on the cable grip. Carry the attached rope over the demountable pulleys for pulling the cable.

(e) Depute one person at each pole to monitor and in case it is required to guide the cable over the demountable pulley during pulling operation.

(f) The cable should be pulled till the cable reaches the last pole of the section.

(g) Wherever in the pulling section; through pulling is difficult; half section or one fourth, action pulling method may be adopted by using figure of a techniques.

(h) The feeding and pulling of the cable should be synchronized by using communication link. Care is required to be taken so that the cable is not accumulated at any one point during pulling operation and sharp bends are avoided.

(i) Once the cable reaches the other end actual tensioning of the cable and fixing the installation of the accessories and fixtures shall be taken up with the help of cable pulling winch. The pulling tension must be monitored during tensioning.

(j) Install the tension fittings and accessories at the 1st pole.

(k) Fix a flat twin open type cable grip on the cable after tension pole for tensioning the cable in the preceding tension section.

(l) The cable shall be tensioned to a tension of 1-3 to 1-6 times of the cable weight. The sag shall be monitored and kept between 0.25 to 0.5% of the span length.

(m) The cable should be lifted between two poles by using cable pole fork during tensioning and fixing of the cable.

(n) During the fixing operation the cable shall remain under required tension for minimizing the sag in the splice section.

(o) Now install tension fitting and accessories at the all tensioned pole at the end of the tension section.

(p) Install the suspension fitting and accessories on the intermediate poles in the tensioned section.

(q) Similarly installation should be carried out in each tension pole in the entire section and the tension and suspension fittings are in stalled.

(r) At the Through tension poles the cable shall be kept loose and shall be supported by cable jumper clamp.

(s) At the end pole where the cable reel is kept; the cable to be taken through GI pipe (fixed to the pole) to the splice location.

(t) Extra care for the aerial O.F. cable may be taken at the bends and at entry and at the exit of the pipe. About 10 meters of cable shall be kept at the splice location for coiling (spare cable) and jointing requirement.

(u) Test the installed OF cable.

(v) Coil the OF cable and keep it safe in the splice location for splicing.

3.12 PECAUTIONS

(a) Provide display boards.

(b) Provide sufficient number of road sign and traffic cones.

(c) Avoid sharp bending of the OF cable during installation.

(d) The OF cable should not be given extra tension than the permissible tension limits.

(e) While crossing the overhead electric installations, safety measures should be taken. Also provide guard wire.

(f) To avoid man made damages, safety measures should be taken for each pole.

3.13 REFERENCE

TEC GR on Planning Guidelines and the Installation Practices for the installation of self supporting metal free aerial optical fiber cable.

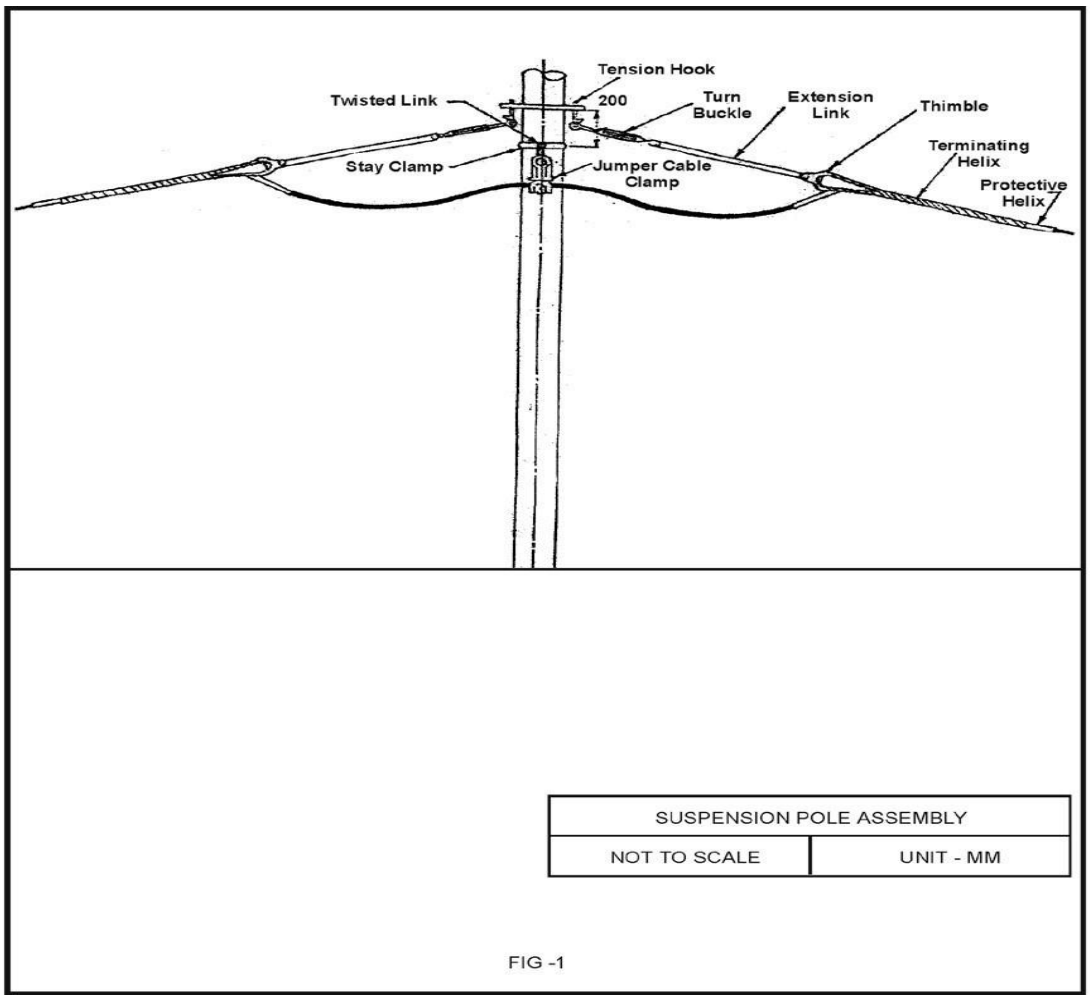
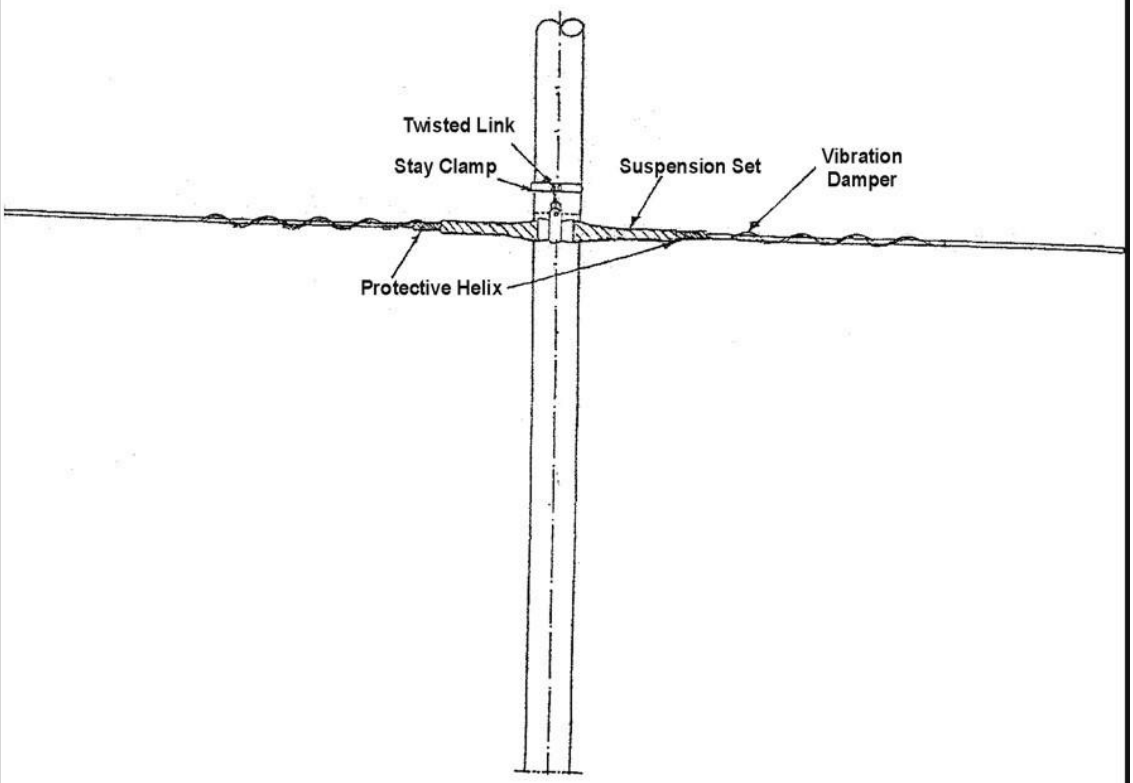
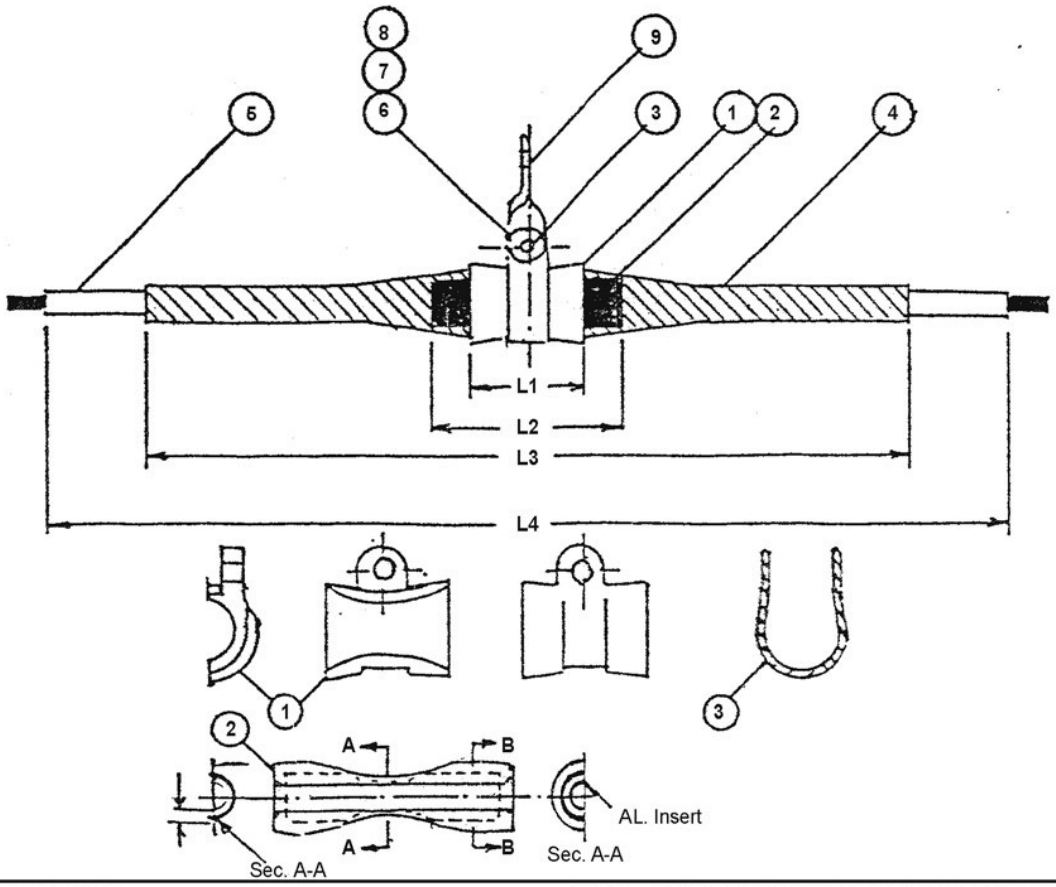


FIG -1



SUSPENSION POLE ASSEMBLY	
NOT TO SCALE	UNIT - MM

FIG - 2



(FOR EXAMPLE)
DIMENSIONS :- CABLE SIZE - 14.4 MM DIA.

CABLE DIA	L1	L2	L3	L4	COLOUR CODE	DIA AGS.ROD
14.4	115	200	800	1400	BROWN	4.25± 0.1

NOTE :- DIMENSIONS FOR DIFFERENT CABLE SIZES TO BE DECIDED AFTER TYPE TEST APPROVAL

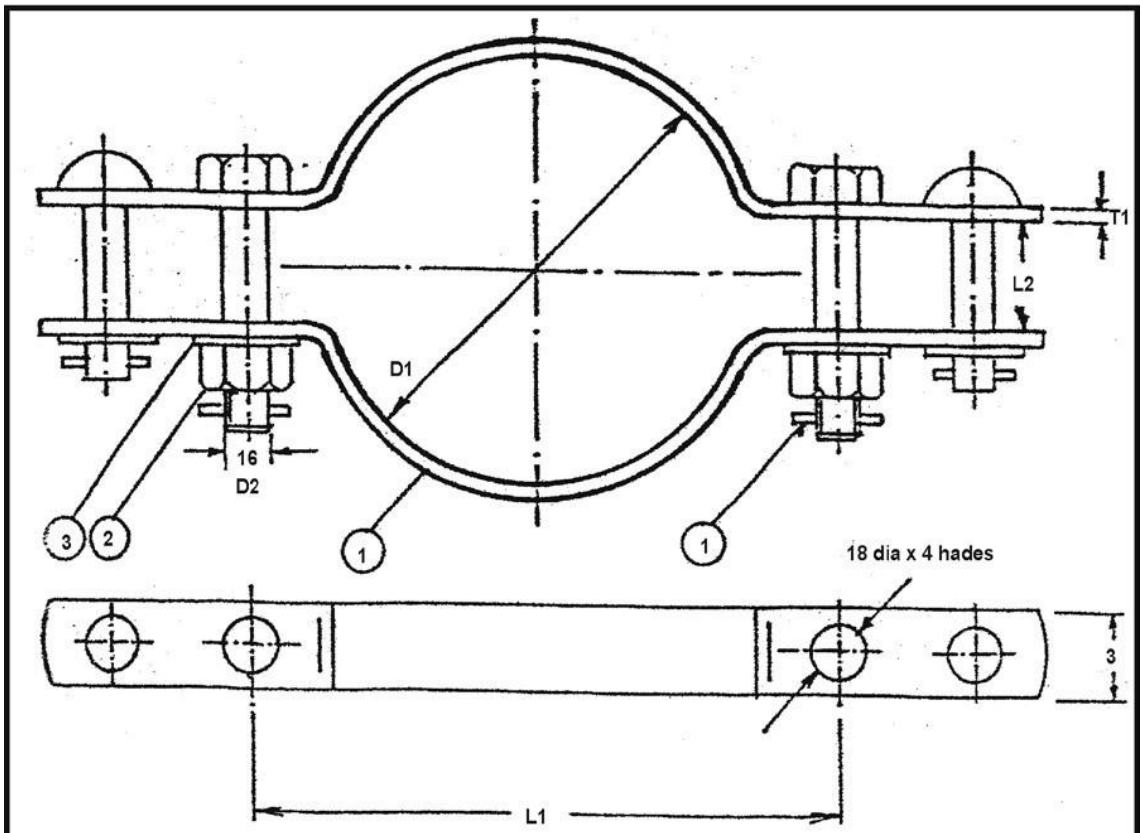
INSERT DIMENSIONS IN MM

INNER DIA.	AT - A - A 22	AT - B - B 22
OUTER DIA.	33	60

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	CLAMP)	ALUMINIUM ALLOY GDC	1S : 617	1 SET
2	INSERTS) SUSPEN. CLIPPER	POLYCHLOROPRENE COMPOUDED	1 PAIR	1 PAIR
3	STRAP)	ALUMINIUM ALLOY	IS : 617	1
4	AGS HELIX	ALUMINIUM ALLOY 6061		1 SET
5	PROTECTIVE HELIX	ALUMINIUM ALLOY 6061		1 SET
6	RIVET M 16	MILD STEEL GAVLVANISED	IS : 2062	1
7	FLAT WASHER	MILD STEEL GALVANISED	IS : 2016	1
8	SPLIT PIN	STAINLESS STEEL	IS : 2549	1
9	TWISTED EYE	MILE STEEL GALVANISED	IS : 2062	1

ARMOUF GRIP SUSPENSION SET	
NOT TO SCALE	UNIT - MM

FIG - 3



POLE MOUTED STAY CLAMP (RAIL)

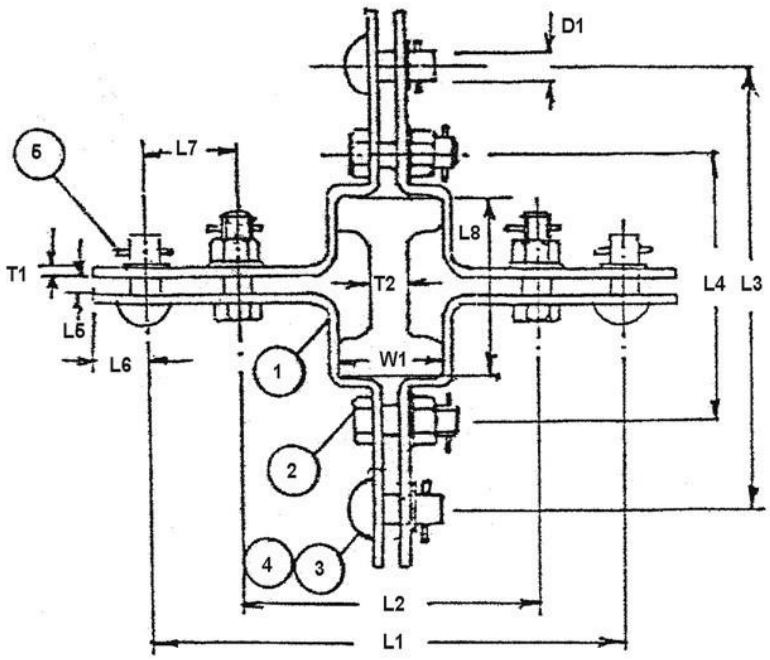
L1	L2	L3	L4	L5	L6	L7	L8	T1	T2	D1	W1
270	170	251	151	20	32	50	120	5	20	16	60

NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR UNLESS UNTILL SPECIFIED)
HOT dIP Galvainised as per is : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	CLAMP	MILD STEEL GALVANISED	IS : 2062	1 SET
2	BOLT & NUT M 16	MILD STEEL GALVANISED	IS : 1363	2
3	RIVET 16	MILD STEEL GALVANISED	IS : 2016	2
4	WASHER	MILD STEEL GALVANISED	IS : 2016	4
5	SPILT PIN	STAINLESS STEEL	IS : 549	4

POLE COLLAR CLAMP	
NOT TO SCALE	UNIT - MM

FIG - 4



DIMENSIONS IN MM :
POLE MOUTED STAY CLAMP TUBULAR

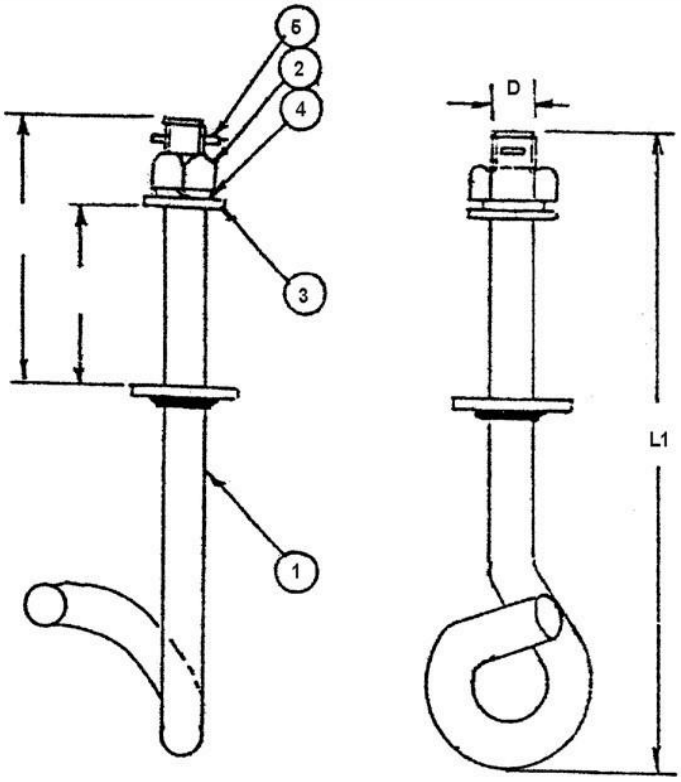
L1	L2	D1	D2	T1	W
210	20	150	16	5	30

NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR UNLESS UNTILL SPECIFIED)
HOT DIP GALVANISED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	CLAMP	MILD STEEL GALVANISED	IS : 2062	1 SET
2	BOLT & NUT M 16	MILD STEEL GALVANISED	IS : 1363	4
3	RIVET 16	MILD STEEL GALVANISED	IS : 2016	4
4	WASHER	MILD STEEL GALVANISED	IS : 2016	8
5	SPILT PIN	STAINLESS STEEL	IS : 549	8 SET

POLE COLLAR CLAMP (R)	
NOT TO SCALE	UNIT - MM

FIG - 5



DIMENSIONS IN MM :

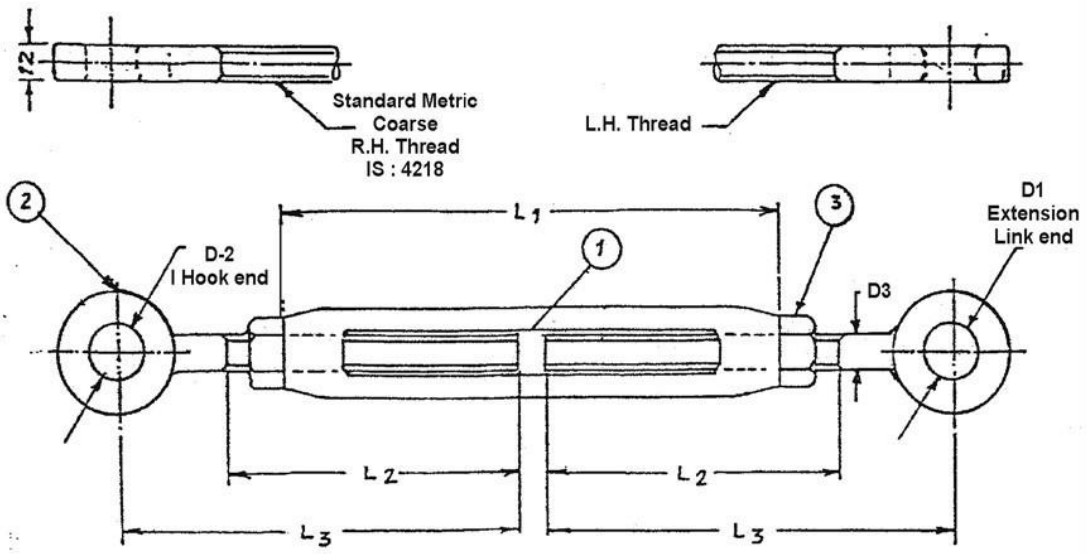
L1	L2	L3	D
177	75	50	12

NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)
TO BE USED HERE C-BRACKET IS AVAILABLE ON POLE FOR FITMENT OF TENSION HOCK
HOT DIP GAVANISED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	BODY	ALLOY STEEL GALVANISED	IS : 2004	1
2	NUT	MILD STEEL GALVANISED	IS : 1363	1
3	PLAIN WASHER	MILD STEEL GALVANISED	IS : 2016	1
4	SPRING WASHER	SPRING STEEL GALVANISED	IS : 3063	1
5	SPILT PIN	STAINLESS STEEL	IS : 549	1

TENSION HOOK	
NOT TO SCALE	UNIT - MM

FIG - 6



DIMENSIONS IN MM :

L1	L2	L3	D1	D2	D3
170	100	140	18	18	12

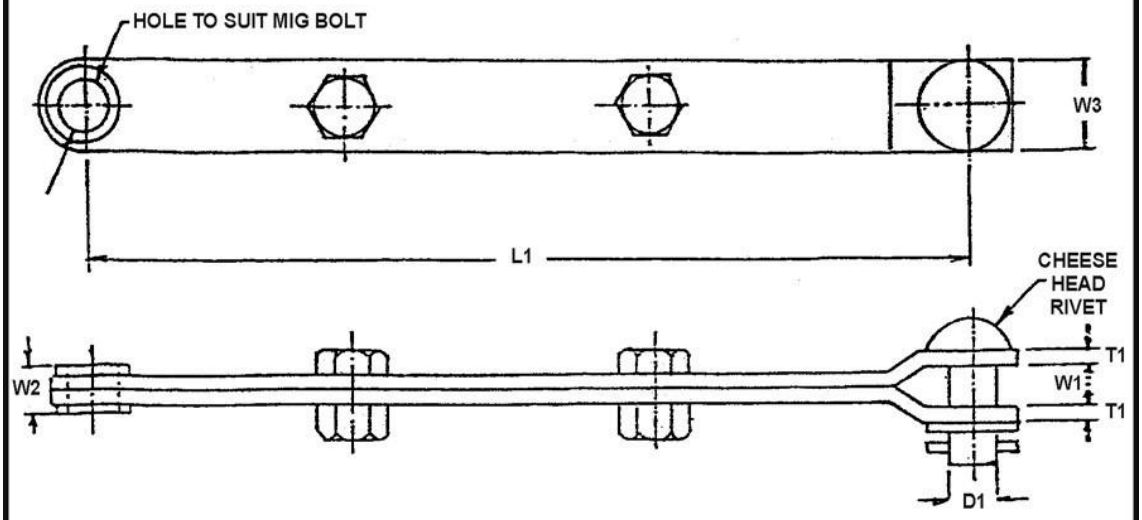
NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

MIN. LENGTH : 290 MM
MAX. LENGTH : 400 MM
RANGE OF ADi. : 110 MM
HOT DIP. GALVANISED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	BODY	MILD STEEL FORGED GLAV.	IS : 2004	1
2	NUT BOLT	MILD STEEL FORGED GLAV.	IS : 2062	2
3	NUT	MILD STEEL	IS : 1363	2

TURN BUCKLE	
NOT TO SCALE	UNIT - MM

FIG - 7



DIMENSIONS IN MM :

L1	T1	W1	W2	W3	D1
465	5	14	16	30	16

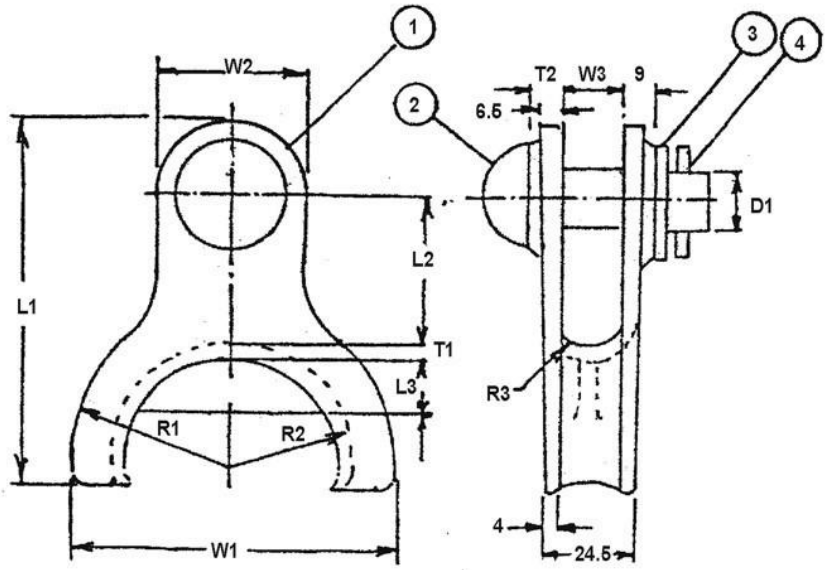
NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

HOT DIP. GALVANISED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	STRAP	MILD STEEL GALVANISED.	IS : 2067	1
2	RIVET & WASHER	MILD STEEL GALVANISED	IS : 2016	1
3	SPLIT PIN	STAINLESS STEEL	IS : 549	1
4	BOLT & NUT M 16	MILD STEEL GALVANISED	IS : 1363	1

EXTENSION LINK	
NOT TO SCALE	UNIT - MM

FIG - 8



DIMENSIONS IN MM :

L1	L2	L3	T1	T2	R1	R2	R3	W1	W2	W3	D1
102	42	15	4	9	23	15	8	92	40	18	16

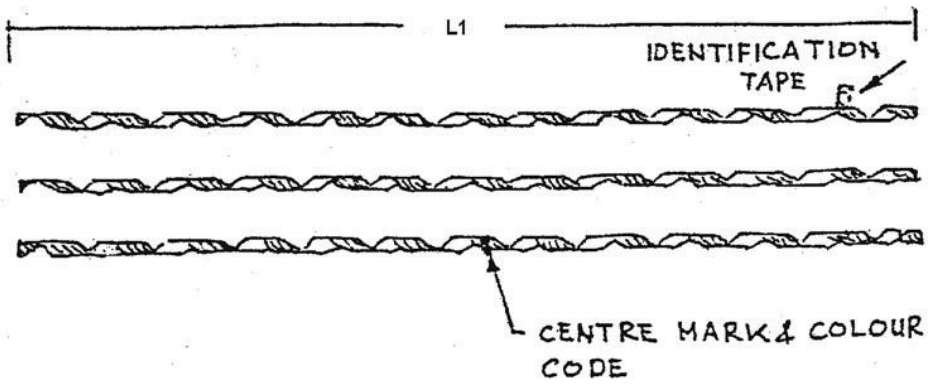
NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

FEROUS PARTS ARE HOR DIP GALVANISED
AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	CLAMP	ALUMINIUM ALLOY GDC.	IS : 617	1
2	RIVET M16 x 45	GALV. STEEL	IS : 2016	1
3	WASHER	GALV. STEEL	IS : 2016	1
4	SPLIT PIN	STAINLESS STEEL	IS : 549	1

CLEVIS THIMBLE	
NOT TO SCALE	UNIT - MM

FIG - 9



FOR EXAMLE
DIMENSIONS (FOR CABLE SIZE, D - 14.4 MM)

I. DIA OF EACH WIRE - 3.2 ± 0.1
II. NO. OF SETS - 3
III. NO. OF WIRE PER SET - 5
IV. LENGTH OF HELIX - 1400

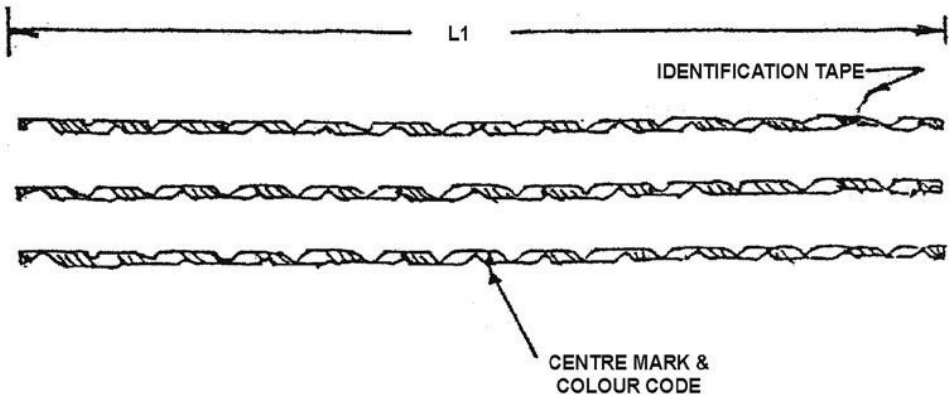
DIMENTION DETAILS FOR OTHER CABLE SIZE SHALL BE INDICATED BY THE MANUFACTURER INCLUDING THE PITCH OF HELIX

NOTE : ENDS OF RODS SHALL BE DEBURRED TOLERANCE SHALL BE AS PER IS : 2102 (DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	PROTECTIVE HELIX	ALUMINIUM ALLOY 6061		

PROTECTIVE HELIX (S)	
NOT TO SCALE	UNIT - MM

FIG - 10



FOR EXAMLE
DIMENSIONS (FOR CABLE SIZE, D - 14.4 MM)

I. DIA. OF EACH WIRE - 3.2 ± 0.1
II. NO. OF SETS - 3
III. NO. OF WIRE PER SET - 5
IV. LENGTH OF HELIX - 1000

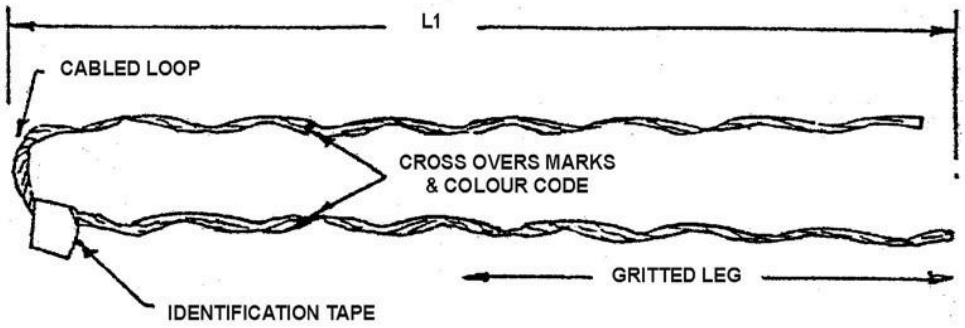
DIMENTION DETAILS FOR OTHER CABLE SIZE SHALL BE INDICATED BY THE MANUFACTURER INCLUDING THE PITCH OF HELIX

NOTE : ENDS OF RODS SHALL BE DEBURRED TOLERANCE SHALL BE AS PER IS : 2102 (DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	PROTECTIVE HELIX	ALUMINIUM ALLOY 6061		

PROTECTIVE HELIX (T)	
NOT TO SCALE	UNIT - MM

FIG - 11



DIMENSIONS
FOR EXAMPLE

L1	T1
1000	2.2±0.1

D IS DIA OF EACH WIRE ROD
NO. OF WIRES USED 5

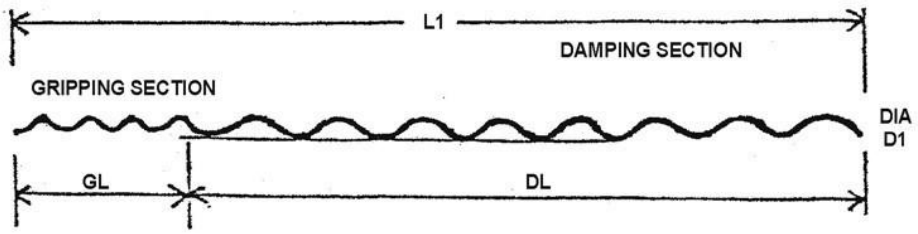
NOTE : TOLERANCE SHALL BE PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

DIMENSION DETAIL FOR DIFFERE CABLE SIZES TO BE DECIDED AP TYPE TEST APPROVAL
FOR EXAMPLE CABLE SIZE
ENDS OF RODS SHALL BE DEBUR LENGTH OF TERMINATING HELIX 1000 MM,
TER MINATING HELIX TO BE USED WITH THIMBLE C DIA - 14.4 MM

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	DEADEHD GRIP	ALUMINISED STEEL		

TERMINATING HELIX	
NOT TO SCALE	UNIT - MM

FIG - 12



DIMENSIONS IN MM

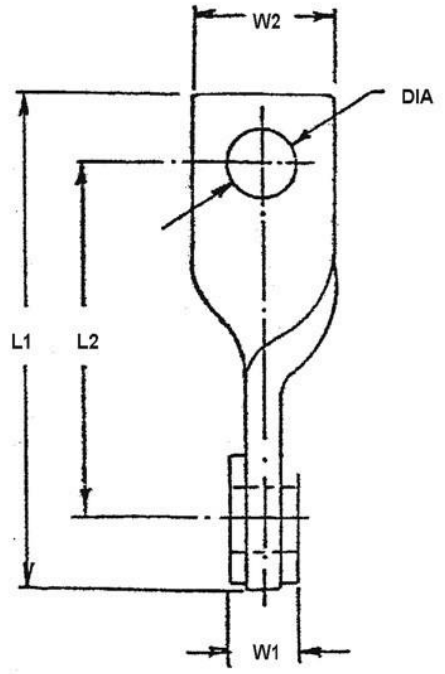
L1	GL	DL	D1
1346	446	900	12±1

NOTE : TOLERANCE SHALL BEAS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	SPIRAL VISRATION DAMPER	POLYVINYL COKPOUNDED		

SPIRAL VIBRATION DEMPER	
NOT TO SCALE	UNIT - MM

FIG - 13



DIMENSIONS IN MM

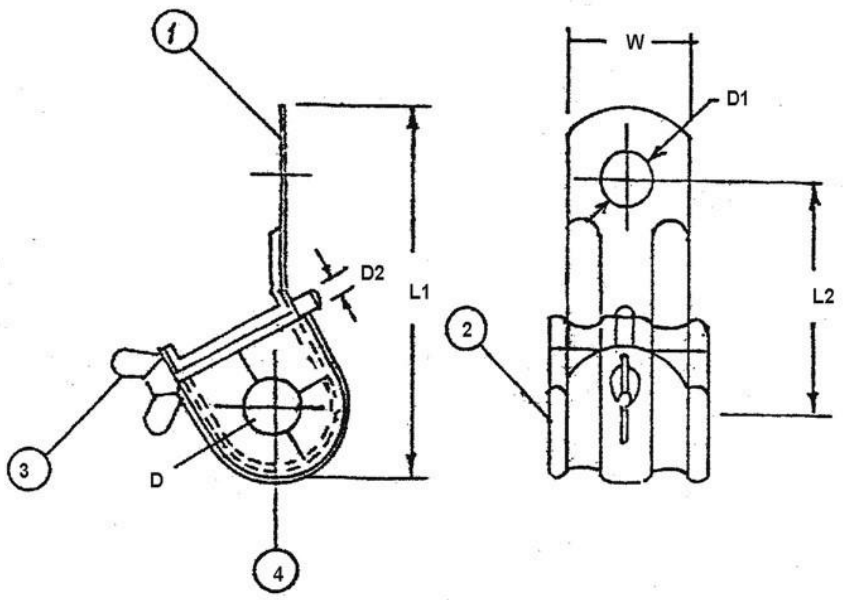
L1	L2	W1	W2	DIA
138	100	27	38	18

NOTE : TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)
HOT DIP GAVANISED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	LINK	MILD STEEL	IS : 2062	1

TWISTED EYE LINK	
NOT TO SCALE	UNIT - MM

FIG - 14



DIMENSIONS IN MM

L1	L2	D1	D2	W
105	65	17.5	5-6	35

DIMENSIONS IN MM OF INSERT PAD

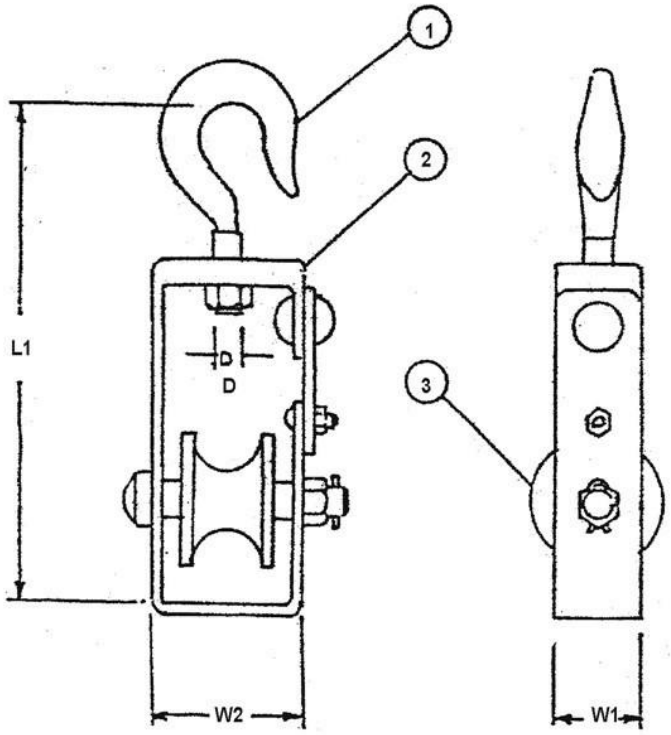
L	INNER DIA	OUTER DIA
40	15	30

NOTE : TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)
INSERT IN TOW HALVES D TO SUIT CABLE DIA FERROUS PARTS ARE HOT DIP GALVASIED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	STRAP	MILD STEEL GALY	IS : 2062	1
2	INSERT	POLYCHLORADPRENE COMPOUNDED		1
3	WING BOLT	MILD STEEL GALY	IS 2062	1

JUMPER CABLE CLAMP	
NOT TO SCALE	UNIT - MM

FIG - 15



DIMENSIONS IN MM

L1	W1	W2	D
280	50	92	12

NOTE : TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)
FEFFOUS PARTS ARE HOT DIP GALVANISED AS PER IS : 2629

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	HOOK	GALVANISED STEEL		
2	BODY	GALVANISED STEEL		1 SET
3	SPOOL	ALUMINIUM COATED NEOPRENE		

DEMOUNTABLE PULLEY	
NOT TO SCALE	UNIT - MM

FIG - 16

4. Post based, ADSS on LT/HT Electrical Poles

4.1 Overview

(a) The location of the tensioner and puller relative to the structure must be selected so that the pole is not overloaded. Where possible, a pulling slope of 75º to 80° is considered good practice. This ratio will minimize the load on the cable, traveler, sheave, or quadrant block, and pole. It may be necessary to place temporary guys to prevent overloading support poles. The reel must be placed in-line with the first two poles of the run to prevent twisting of the cable or any damage to the cable caused by rubbing the sides of the traveler, sheave, or quadrant block groove.

(b) Anchors and pole hardware must be rated above the expected environmental load of the cable, plus a safety factor. In installations where aeolian vibration could be an issue, the safety factor should be increased. At locations where the cable is tensioned to achieve proper sag, the pole may require a temporary down-guy and anchor to prevent overloading the pole.

(c) Travelers, sheaves, or quadrant blocks are normally attached directly to the support pole. The pole attachment, used to support the traveler, sheave, or quadrant block must be consistent with the working load and rating of the traveler, sheave, or quadrant block.

(d) The pulling grip shall be rated above the maximum pulling tension anticipated. Use the manufacturer's instructions for the proper application. When properly installed, no special preparation of the cable end, or aramid yarns, are required. A matching clevis type swivel should be used to help prevent twisting of the cable during pull-in. The swivel should be of the type that has a break-away tension less than or equal to the cable's rated maximum pulling tension to prevent over tensioning the cable.

(e) Aeolian vibration is a resonant vibration caused by low velocity wind blowing across a cylindrical cable that is under tension. This vibration can cause severe degradation of the cable support hardware. Vibration dampers can be very effective in controlling aeolian vibrations when used on ADSS cable. Both resonant and interference type vibration control systems will work when properly applied.

(f) Splice locations require additional cable be provided to accommodate lowering the cable to the ground with enough slack to allow splicing inside a splicing van or trailer.

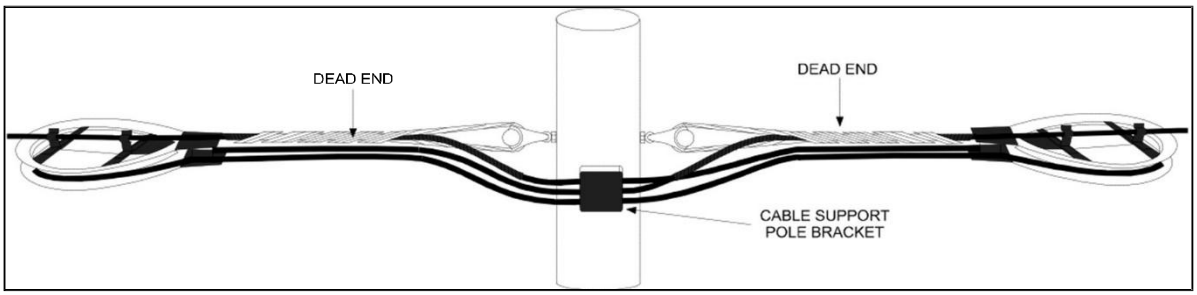


Figure: C – Cable Slack Storage

(g) All sl ack cable storage locations require the installation of slack cable storage

brackets. The strand cable storage bracket insures a proper bending radius for the stored fiber optic cable and provides for horizontal storage and tiering for storage of multiple cables and loops. Figure 3 below illustrates slack cable storage.

4.2 ADSS Cable Support Hardware:

There are two general types of ADSS cable support hardware: dead ends and tangent assemblies.

4.2.1 Dead-end assemblies:

(a) Deadend assemblies are used at the point of cable termination, or where the cable angle is greater than 20°. See Figure 4 below for illustration of a Deadend Assembly.

(b) The Structural Reinforcement Layer (SRL) is a subset of armor rod that is the first layer applied to the ADSS cable. They are spiraled in a precise twist lay to match the diameter and load of a specific cable. They are normally grouped together in a sub-set of four to five rods, with grit applied to the inside for slip resistance.

(c) The Deadend Grip itself is a set of armor rods that have been formed in a double spiral with a loop at one end. Its precise twist is designed to perfectly match the diameter of the SRL as it lay over the cable. The length of the deadend grip is dependent upon the maximum load. It too has grit applied to the inside for slip resistance.

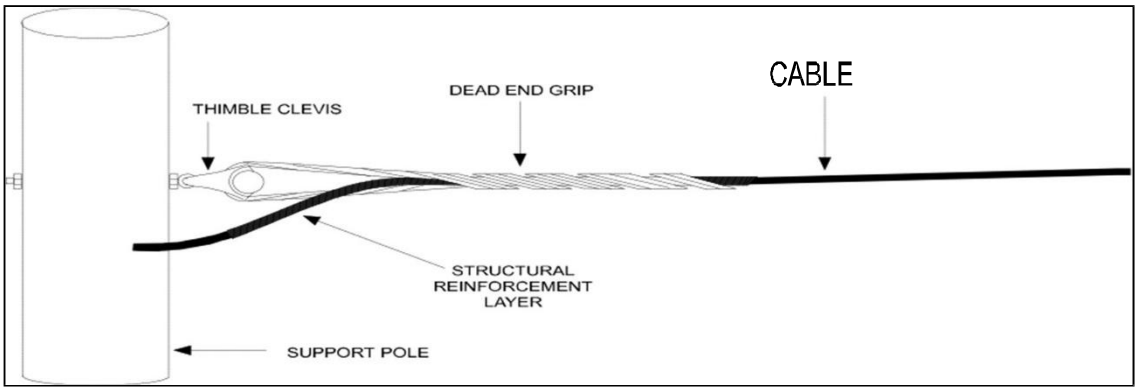


Figure: C – Cable Slack Storage

(d) The Thimble Clevis is made of cast aluminum or steel and is used to maintain the seat diameter of the deadend loop.

(e) The deadend hardware is assembled in the following manner:

(i) The SRL rod is assembled on the cable first. The end with the color band is assembled towards the end of the span. Wind on one set of rods at a time. The rods should be placed close together so that there is enough room for them all.
(ii) The tips of the SRL rods should align at the end. Do not force the rods or use tools to install them. Forcing the rods or using tools may damage the cable jacket.
(iii) Align the color band on the deadend with the color band on the SRL and wind one leg of the deadend on approximately two feet.

(iv) Insert the thimble clevis into the loop.
(v) Align the color band on the second deadend leg with the color band on the first deadend. Wind the second deadend leg over the SRL for approximately two feet. Continue winding the deadend legs over the SRL until both legs are snapped in place.
(vi) Connect the thimble clevis to the hardware (or to the extension link and then the hardware) mounted on the pole

4.2.2 Tangent Assemblies:

Tangent hardware is normally installed after the span has been tensioned. Figure D below illustrates a front and side view of a Tangent Support. To install the cable, open the hinged top and insert the bottom pad. Then place the cable on the pad, place the top pad over the cable, close the top and tighten the bolt to hold the cable in place.

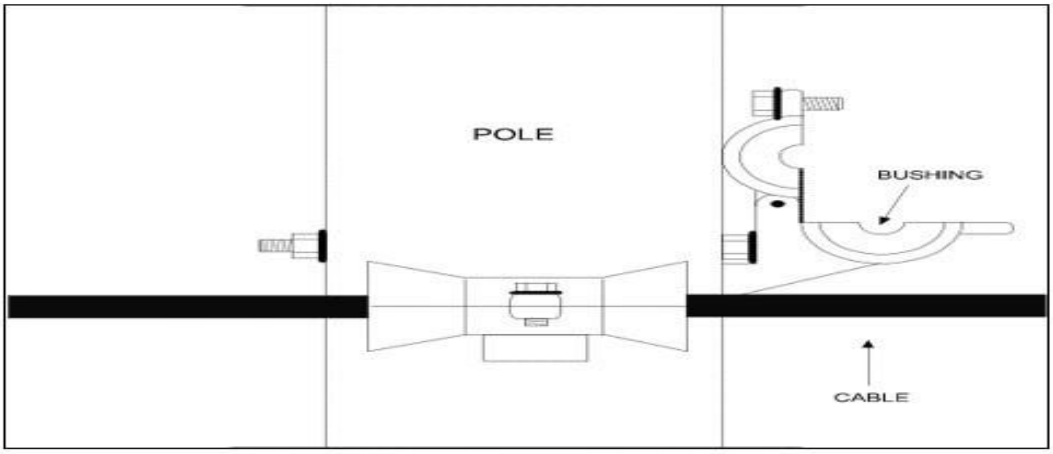


Figure: D

4.2.3 ADSS Sagging and Tensioning:

(a) Upon completion of placing the entire run of cable, sagging and tensioning can now be started. Sagging and tensioning the run is worked progressively from one end of the run towards the opposite end. Normally the slack is worked back in the direction of the reel in order to recover as much cable as possible. Sagging and tensioning should be conducted according to the cable manufacturer's recommendations for the cable just installed.

(b) The cable run is broken down into subsections for sagging and tensioning purposes. The last structure at each end of a section being sagged and tensioned is a deadend assembly. Remove all excess slack cable out of the section of the run being prepared for sagging and

tensioning. To remove the slack, reverse the tensioner and pull the cable back towards the reel, being careful not to exceed the minimum bending radius for the cable under tension.

(c) Once the slack is out of the cable, install a temporary deadend on the cable approximately 2 deadend assembly lengths away from the support pole. This deadend will be used as a tensioning grip to achieve proper span sag and tension, prior to installing the permanent deadend assembly.

(d) Attach the tensioning device: a chain hoist or power winch and a dynamometer between the pole and the temporary deadend. Begin to apply tension to the span.

(e) The cable is normally tensioned from deadend to deadend along the span back to the reel. Once the spans are properly sagged and deadends attached, the suspension or tangent hardware is installed and attached to the poles by working back to the deadend one span at a time.

(f) With a span's permanent deadend installed and the hardware attached to the poles, the pulling device can now have its tension released and the temporary deadends removed from the cable. When the next permanent deadend is installed on the adjacent span, make sure that the loop formed between the two deadends maintains the minimum bend radius for the cable. Repeat this operation until all spans are sagged and tensioned.

5. Conclusion

As All Dielectric Self-supporting Aerial Cable (ADSS) are made of brittle material, so it can't put too much strain and fiber diameter is very small, so he's tensile strength very weak .In choosing the cable hardware, the principle is not only to meet all the features and characteristics of the cable should be inclusive , but shall take into account the payment of grip strength with uniform , non-metallic sheath degradation , wear , vibration breeze , dancing , exceed the allowable bending stress and reverse parameters. Therefore, the general provisions are "Hardware's squeeze should not exceed with more than two cables design limits, hardware should not be designed for a range of diameters."

Abbreviations:

1. ADSS – All Dielectric Self Supporting optical fibre cable
2. MASS – Metal Free Aerial self supporting cable
3. OFC – Optical Fibre Cable
4. OPPC – Optical Phase Conductor
5. KV – Kilo Volt
6. LT – Low Tension
7. HT – High Tension
8. FTTH – Fibre To The Home
9. dB – decibel
10. Km – Kilometre
11. TEC GR – Telecommunication Engineering Centre (Department of Telecom, Govt of India) Generic Requirements.
12. IEEE – Institution of Electrical and Electronics Engineers
13. IEC – International Electro technical Commission

14 Aeolian vibration : Wind induced (Aeolian) vibrations of conductors and overhead shield wires (OHSW) on transmission and distribution lines can produce damage that will negatively impact the reliability or serviceability of these lines.

15 C- Bracket

16 D-Dia of cable

17 degree C : Degree Centigrade

18 EI : Engineering Instruction

19 OF cable : Optical Fibre Cable

20 SVD : SPIRAL VIBRATION DAMPER

21 TEC GR : Generic Requirements issued by the Telecommunication Engineering Centre New Delhi.

Annexure-E TECHNICAL SPECIFICATION FOR GIS MAPPING OF OFC ROUTES AND PROJECT MANAGEMENT TOOL

1. General requirements

1.1 State NOC (S-NOC) Integration with Central NOC (C-NOC)

- PIA shall ensure integration of S-NOC with C-NOC including NMS and all EMSs, such as IP-MPLS routers, RFMS, mini-OLT, alternate technology, etc.

- PIA shall ensure seamless integration of S-NOC applications such as Fault management, Performance management and Trouble ticket management etc. with C-NOC.

- PIA shall establish mechanisms for real-time data synchronization between S-NOC and C-NOC applications. The integration shall be based on open APIs and event-based data shall be pushed by S-NOC to C-NOC on near real time basis.

1.2 Geographical Information System (GIS)

- PIA shall perform GIS based desktop planning, preliminary design, detailed video graphic survey, GIS data collection during execution for creation of digital As Built Drawing (ABD), digial ITP Sheet on GIS.

- PIA shall collect and maintain the inventory of both physical and logical resources of OSP (outside plant - fibre, chamber, splice-closure, coupler etc.), ISP (Inside Plant: room, rack equipment's and their connectivity) and power infra.

- PIA shall maintain and store all details of deployed network infrastructure till the readiness of C-NOC. After readiness of C-NOC, PIA shall upload all GIS data.

- PIA shall upload all required GIS details such as data files, videos, photos, etc. on C-NOC GIS application.

- PIA shall provide all required information related to network to C-NOC for fibre inventory management.

Note: The specific functional criteria listed in clause no. 2 below for the GIS mapping of OFC routes.

1.3 Asset management

- PIA shall maintain a detailed inventory of all BharatNet network assets, including but not limited to routers, switches, OFC, RFMS and other infrastructure components. This inventory will be validated by the Independent Engineer (IE) and then approved by the GFGNL.

- PIA shall manage the entire asset lifecycle of BharatNet infrastructure. PIA in consultation with GFGNL shall assign unique identifiers or tags to network assets and infrastructure elements in the field, such as routers, switches, fibre cables, splice points, junction boxes, and termination points etc.

1.4 Project Monitoring

- PIA shall provide necessary inputs regarding the progress and status of the project implementation in the Project Monitoring tool to be deployed at GFGNL. This input is crucial for creating and overseeing project schedules, milestones tracking, and monitoring of timelines within the project. PIA will provide PM tool. It is the responsibility of PIA to capture the datapoints for work progress. The capturing/entry into digital PM tool is very critical and essential as it bears direct co-relation with eligibility of seeking payments. Any lapses will result into denial of claims. The detailed requirements are given in clause no. 3 below.

1.5 Network Provisioning and Utilization

- The network shall enable retail, enterprise and wholesale services as per the requirement of GFGNL.

- PIA shall provide all necessary support and facilitation to GFGNL and designated service provisioning agencies for provisioning and monitoring of services from S-NOC.

- PIA shall be responsible for coordinating and assisting GFGNL in provisioning and configuring network resources for effective network operations, service provisioning, assurance and utilization through retail or wholesale enterprise services such as FTTH, leased circuits, dark fibre and bandwidth leasing etc.

2. Functional requirements for GIS Mapping of OFC Routes

- Accuracy: sub meter level accuracy (20cm). i.e., The record of Block/Sub-Block/Master Block, GP and any utility shall be maintained within a 50-meter corridor with an accuracy of 20 cm (25 meters on each side of the road's center line or within the road's right-of-way, whichever is greater)

- Format: .shp format with mapping on Geography Coordinate System (GCS) projection system with WGS 84 datum.

- Codification and layer structure will be provided by GFGNL. The PIA shall be responsible to create separate layers for all network elements as per the requirement. However, the indicative structure of the shape files for Block, GP, route markers and OFC layers are as given below:

Block Layer (indicative)

SN	Field	Type	Description
1	Name	String	Block Name
2	Asset Type	String	Block
3	Blk_Name	String	Block Name
4	Blk_Code	String	Block Code
5	Dt_Name	String	District Name
6	Dt_Code	String	District Code
7	St_Name	String	State Name

Block Layer (indicative)

SN	Field	Type	Description
8	St_Code	String	State Code
9	Lat	Double	Latitude
10	Long	Double	Longitude
11	Cable_Len	Double	Cable Length
12	Remarks	String	if any
13	Obs	String	Observation
14	Status	String	Editing Status/It should be blank
15	Block_ip	String	IP address of BLOCK
16	geo_photo	String	Photo with geo- location
17	Vendor	String	Name of vendor
18	Phase	String	1/2/3
19	Model	String	DBOM
20	Technology	String	IP-MPLS

GP Layer (indicative)

SN	Field	Type	Description

1.	Name	String	GP Name
2.	Asset Type	String	GP
3.	Asset_Code	String	GP Code
4.	LGD_Code	String	LGD Code for Location
5.	Location	String	Location Name of GP
6.	Loc_Type	String	School, College, GP, PANCHAYAT BHAWAN etc.
7.	GP_Code	String	GP Code
8.	NMSBLOCK_CD	String	NMS BLOCK Code
9.	NMSGP_C D	String	NMS GP Code
10.	Blk_Name	String	Block Name
11.	Blk_Code	String	Block Code
12.	Dt_Name	String	District Name
13.	Dt_Code	String	District Code
14.	St_Name	String	State Name
15.	St_Code	String	State Code
16.	Lat	Double	Latitude
17.	Long	Double	Longitude
18.	Cable_Len	Double	Cable Length
19.	Remarks	String	Remarks from GFGNL
20.	Obs	String	Observations
21.	Status	String	Editing Status/It should be blank
22.	Block _ip	String	IP address of Block
23.	GP_mac_id	String	Mac Id of GP
24.	Otdr_len	Double	Length in meters
25.	Conn_str	String	PIC-PON- GP ID
26.	GP_sr_no	String	Device serial no.
27.	Backhaul	String	OFC or R F / Sat

GP Layer (indicative)

SN	Field	Type	Description
28.	geo_photo	String	Photo with geo-location
29.	Phase	String	1/2/3
30.	Route_code	String	New/Old

OFC Layer (indicative)

SN	Field	Type	Description
1	Name	String	OFC Route name
2	Asset Type	String	Leased/Incremental
3	Asset_Code	String	Segment Code
4	Blk_Code	String	Block Code
5	Dt_Code	String	District Code
6	St_Code	String	State Code
7	CS	String	Cable Section
8	Seg_Length	Double	Route length
9	Start_Node	String	Starting Asset
10	S_Cable_Len	Double	Starting Cable Length
11	End_Node	String	Ending Asset
12	E_cable_Len	Double	Ending Cable Length
13	num_fibre	String	24/48
14	Status	String	Editing Status/ It should be blank
15	Remarks	String	Remarks from GFGNL
16	Obs	String	Observations
17	Traverse	String	FIBRE POSITION e.g. 'U' For Underground, 'O' for Overhead

18	fibre_pos	String	Left/ Right of the road
19	Direction	String	Towards GP or Block
20	Phase	String	1/2/3
21	Route_code	String	New/Old

Route marker (indicative)

S N	Field	Type	Description
1	Name	String	Route marker NAME
2	Type	String	Asset Type
4	Blk_Name	String	Block Name
5	Blk_Code	String	Block Code
6	Dt_Name	String	District Name
7	Dt_Code	String	District Code
8	St_Name	String	State Name
9	St_Code	String	State Code
10	Lat	Double	Latitude
11	Long	Double	Longitude
12	rd_Offset	Double	Offset from centre of the Road

Route marker (indicative)

S N	Field	Type	Description
13	CS	String	Cable Section
14	Remarks	String	Remarks from GFGNL
15	Obs	String	Observations
16	cable_len	String	if any
17	Status	String	Editing Status/ It should be blank
18	geo_photo	String	Photo with geo-location

19	fibre_pos	String	Left/ Right of the road
20	Direction	String	Towards GP or Block
21	Phase	String	1/2/3
22	Route_code	String	New/Old

Note: For other required layers similar structure may be envisaged.

2.1 GIS data collection

- PIA shall conduct survey of the Block and associated routes from Block to Gram Panchayats (GPs) to evaluate the existing and new fiber cable needs for network implementation.

- PIA shall collect coordinates of landmarks such as culverts, bridges / nallah, water bodies, crossroads, railway crossing, flyovers and public places like temples/mosques, bus-stop, PHC, post office, school/college, shops, police stations, banks, tourist spots, hospitals, etc. to be captured along with the route marker, cable joints, etc. along with the cable routes. One additional reading in the middle of the two manholes / RI should be recorded in the already laid network. Recordings are necessarily to be made at every fibre turn, bend along the route, road/railway crossing, culverts, diversion etc. Sufficient recordings at short intervals on the curvature of the route shall be captured to map it on GIS properly.

- PIA shall collect photos of various assets such as Blocks, GPs, manholes, joint chambers, FDMS, route markers etc. with geo tagged images.

- PIA shall collect information about terminated and spare fibres, loops, cable types/sizes and optical test results for each fibre, utilizing previously recorded data from GFGNL. This includes port-by-port fibre configurations, termination details, and OTDR readings for Blocks and Gram Panchayats (GPs) PIA shall collect cement/electronic route marker (lat- long) details for route marker identification.

- PIA shall collect information about road length, width and type (RCC etc.). variation in width of road in meters taking offset from the center of the road.

- PIA shall gather details about authorities such as railway, National Highways (NH) and forest departments within the limits of the OFC path required for RoW permissions.

- The point feature like poles, sewerage manholes, other utility chambers, transformers, bore well etc. shall be captured as a point.

- The record of Block, GP and any utility shall be maintained within a 50-meter corridor with an accuracy of 20 cm (25 meters on each side of the road's center line or within the road's right-of-way, whichever is greater)

- To and fro direction towards village, town, city etc. shall be recorded for all roads.

- The geo coordinates of all road KM stones shall be recorded and shown using symbol provided.

- Note: All the asset locations on ground are to be geo-tagged in five photographs (one close-up and four from different directions covering road part and also landmarks, if visible) and videography (zoom & wide angle) to be taken so as to identify the exact point later on. There will be a practical situation where the route markers will be found missing, in such situation a play card with the notional assets no. available RID/ABD to be placed on the identified point.

2.2 Mobile app for data collection from field

PIA shall provide mobile application & video recording solution for the BharatNet Project to accurately document project activities such as trenching, fibre laying, splicing and equipment deployment. PIA shall provide the Mobile application without any mounting device for capturing information at source. It is the responsibility of PIA to provide accurate information and therefore it is the responsibility of PIA to arrange the GNSS/DGPS for minimum 20cm accuracy as stipulated in the RFP. This is non-negotiable qualitative aspects of accuracy. Failing which captured data shall not be accepted and PIA shall be asked to capture the data again with GNSS/DGPS. The key requirements are given below.

- PIA shall record videos of depth, offset, chainage marking, etc. of overhead or underground alignment type of execution (HDD, OT, Aerial etc.)

- The video should support to record and identify depth, offset, ofc accessories details and landmarks of routes.

- PIA shall ensure that the accuracy of videos and GIS coordinates is within the range of 20 cm. (a sample check of the survey shall be performed on the ground by IE to check the submeter level accuracy (≤ 20 centimeters). GFGNL may use CORS system deployed by Survey of India for measuring the accuracy during sample check. The survey data shall be rejected if the accuracy of the sample data is not in accordance with the desired accuracy).

- The PIA should use suitable devices such as GNSS / DGPS (which can be pole- mounted or handheld as necessary), or any other appropriate technology and mobile applications for conducting surveys to capture GIS coordinates, videos, and photos of completed work.

- The BharatNet mobile app can be used as needed for capturing GIS coordinates, videos, and photos of executed work. The GNSS/ DGPS or any other device used by the PIA must be compatible with the BharatNet mobile app. If the PIA opts for its own application than PIA shall upload videos in

mp4 format and GIS coordinates in shape file format on GFGNL provided GIS application. If the PIA uses the GFGNL mobile app, videos and GIS coordinates will be uploaded automatically.

- If PIA used own mobile app, in such case all videos and photos shall be geo tagged and geo location shall be mentioned in file name. The geographical information shall also be available in header file.

2.2.1 Video specifications:

- Format: MP4 format, minimum 720p & and above resolution, and 30 fps/60fps frame rate with HEVC codec for video compression.
- Content: Each video segment shall clearly capture start and end points of activities, depth readings for trenching/drilling, manhole/cable chamber installation, details of OFC blowing/pulling, splicing activities, route markers, and active equipment deployment procedures.
- Continuous recording: Videos shall be recorded continuously without cuts or edits, and file sizes should be optimized for efficient data exchange.
- Visual evidence: Use calibrated vertical measuring tools to display depth in the video frame at every 10 meters for Open Trenching.
- Verbal commentary: Provide running commentary describing activities, depth measurements, and location references.
- Date and time stamp: Automatically embed date and time stamps in recordings.

- File naming: File names should clearly indicate the type of work, block, and route.

- The following details (indicative) shall be captured in videos:
  - Chainage (CH) details
  - Methodology type
  - Depth and Offset details.
  - Lat long of each pit, RI, splice chamber landmarks etc.
  - Crossing of roads
  - 3 reference points of RI, Block and GP
  - Major crossing
  - Forest area, etc.

Note:

1. Requirements for mobile device/ handset for GIS mobile app

- The PIA shall have dedicated mobile for BharatNet program to capture implementation videos.
- Mobile device shall support minimum android version 13.0 & iOS version 15 for operating the GIS mobile application.

- Mobile device shall support minimum camera capacity of 48 MP or higher and have at least 256 GB storage with augmented cloud storage capabilities as well.
- The camera should provide stable footage with minimal shaking or distortion.

- The video recording needs to be captured in sufficient day light and significant speed of maximum 40mtr/minute and minimum of 20mtr/minute.
- The video recorded and uploaded by PIA to GFGNL shall also be stored by the PIA for future reference, extending for a duration of one year or until invoicing, whichever is higher.

- Mobile device shall support all the required features to fulfill the video recording requirements as given in clause 2.3.3.

2.3 GIS data upload and validation

- GFGNL shall provide online tool and measurement book format for uploading the captured data and information.

- PIA shall upload geotagged images and videos of designated locations in specified formats given in clause 2.4 below. The mobile app of BharatNet shall be used to upload photos and videos to be taken from the sites.

- To upload Block-wise data on GIS application (web and mobile), PIA will provide base maps to facilitate the upload and optimization of captured data and information, including fibre infrastructure and termination details etc.

- Validation of uploaded data shall be done in two stages:

o First stage: The PIA shall upload and verify the Block wise data/ videos/ photos in the GIS application (web/ mobile)
o Second stage: Second level validation shall be done by IE of respective Block.

- If the data correction is required at any stage, the same shall be sent to the PIA for necessary correction.

- PIA shall be responsible to modify/ correct the data and submit for revalidation by the IE/ GFGNL.

2.4 Digital As-Built Drawing (ABD)/ digial ITP Sheet:

- As-Built Drawing (ABD), digial ITP Sheet shall be created digitally on GIS platform.
- PIA shall record details of other operators and utilities such as underground optical fiber cables, utility pipes, transmission cables, and other similar infrastructure, in the digital ABD, digial ITP Sheet wherever possible.

- The geo coordinates of all property boundaries within the fibre route corridor shall be recorded and shown in digital ABD, digial ITP Sheet.
- PIA shall capture physical OFC asset details and locations in respect of locations/ asset visited for capturing GIS data during scope of work as mentioned in this tender.
- Existing data as per documentations/ details made available to PIA w.r.t. to old OFC laid.
- ABD, digial ITP Sheet shall be prepared from Block to GPs during implementation. The ABD, digial ITP Sheet for each block shall be prepared separately. ABD, digial ITP Sheet may have the following details:

Particulars	parameters to be captured (indicative)
Cable details	◦ Make and Size of the cable
Joint chamber details	◦ Location of Joint Chamber (Lat/ Long details in decimal degree format up to six-digit precision) ◦ Depth of Joint Chamber Cover from ground level ◦ Details of cable stack at each joint chamber ◦ 3 reference point of joint locations
Route marker	◦ Location of Route Marker Cement / Electronic (Lat/ Long details in decimal degree format up to six-digit precision) ◦ Route Marker Identification details ◦ 3 reference point of each route marker
OFC Alignment Details	◦ Offset of cable from centre of the road at every 10 meters (Details to be captured from HDD Graph / digital measurement book) ◦ Details of crossings (road / rail / nala etc) should be provided. ◦ Depth profile of cable at every 10 Meter (Details to be captured from HDD Graph / Measurement Book ◦ Details of protection with type of protection (Details to be captured from BSNL provided input) ◦ Locations of culvert and bridges with their lengths and scheme of laying of HDPE / PLB pipe thereon
Landmark Details	◦ Important landmarks to facilitate locating the cable position in future to include important buildings such hospital, religious places, petrol pumps, educational institutes, government offices, commercial complex, major residential complex / building etc

Particulars	parameters to be captured (indicative)
Road feature details	Electric Pole / Transformer Telephone Pole Utility Manhole KM Milestone Street Pole / Lamp Post Median Divider Large Tree

- Readings shall be recorded without any exception at interval of 10 meters including every bend on the road, road/railway crossings, culverts, diversion etc. Each section shall record maximum 200 to 250 meter of the route length.
- All the property boundaries within the corridor shall be recorded and shown in drawing. Three point's references need to be shown for every joint chamber/pull through chamber/manholes.

- Collection of data shall also include custodianship of equipment in each Gram Panchayat.
- All the diagrams shall be verified by the PIA (project manager level person) as a proof of accuracy of the details. The ABD, digial ITP Sheet may have the following details.

o Name of the Project Organization

o Name of the OFC Link with ID

o Name of the PIA

o Name of Survey PIA Rep as part of acceptance test o Name of GFGNL Rep (IE) as part of acceptance test o Date of commencement of work.

o Date of completion of work

- RoW: Railway authority, National highway, Forest authority and any other authority limit along with OFC path shall be captured in ABD, digial ITP Sheet (details will be provided in GFGNL ancillary input data).

- The PIA shall also be provided option to upload ABD, digial ITP Sheet in GIS format (.shp etc.) in the GIS platform through online tool to be provided by GFGNL. In such cases, PIA shall prepare ABD, digial ITP Sheet in GIS format (shape format) of OFC connectivity from Block location to respective Gram Panchayats (GPs), routes data shall be in soft copy.

3. Functional requirements for PM tool

The project monitoring tool shall enable real-time tracking of project progress, (timelines and milestones) including the status of network infrastructure deployment, equipment installation, and connectivity establishment across all packages of Amended BharatNet program.

- PIA shall provide the input for managing project documents, drawings, specifications, permits, contracts, and other relevant documentation etc.
- PIA shall provide all required information for the application dashboard in standard/ defined format such as measurement book, acceptance test proofs etc. The details shall be, but not restricted to, as under: -

o Block/GP wise Cable Length.

o Block /GP wise Duct length.

o Block /GP wise Trench Length.

o Total as build OSP network elements count/details of FDMS/ Handhole/ Manhole/ Site/ Splice Closure etc.

o Total Planned OSP network elements count/details of FDMS/ Handhole/ Manhole/ Router/ Site/Splice Closure etc.

o Total ISP network Elements count/details of Router/ Switch/OLT /Repeater /Equipment's etc.

- PIA shall be responsible to update the project progress in the project monitoring tool, enabling the system to automatically create milestone-based proforma invoices.

3.1 Digital measurement book

- Digital measurement book module of BharatNet C-NOC shall automatically calculate and update the work completed data including route length in RKM, depth etc. based on the videos uploaded during the execution of the work. GIS tool is in separate RFP. RFP is already published on GFGNL website. Pls go through the details for reference.

- PIA shall be responsible to support the measurement book information in the PM tool MB module via mobile application to record work details in the C-NOC MB module if required. The recorded, reading in the MB cannot be deleted. The MB data shall be validated by the (approved/ rejected) by the IE. PIA shall maintain and store all details of measurement book till the completion of C-NOC application. After completion of C-NOC, PIA shall upload all required data in PM tool GFGNL.

- PIA shall also get an option for manual entry of records in digital measurement book of PM tool in case of any issue faced in automated process.

3.2 Inspection and audit module

PIA shall have access of PM tool inspection and audit module, this module shall be utilized by IE to validate the high- and low-level network design, inspect the project and identify any lapses/defect etc. The PIA shall provide comments on the observations and describe the necessary actions required, including specific timelines for completion.

Annexure-F FOR EXISTING RATES OF OFC RECTIFICATION WORK

Sr. No.	Item Description	UOM	Final Rate for Rectification Work Package – A & B
A	**Supply - Passive Infrastructure (Underground Cable) (As per technical specifications given in Annexure-A TEC GR No.)**		
1	Optical fibre Cable 96 core (Ribbon)	Kms.	**1,55,682**
2	Optical fibre Cable 48 core (Ribbon)	Kms.	**81,457**
	Optical fibre Cable 24F Metal Free (Loose Tube)	Kms	**39,000**
3	Supply of Duct	Kms.	**47,700**
4	Supply of Jointing Chamber / Manhole	Nos.	**Price considered in D.1**
5	Supply of joint indicator	Nos.	**Price considered in D.1**
11	Full DWC Pipe (63 mm) of OFC Route Depth .6mts	Kms.	**Price considered in D.1**
12	GI Pipe (63 mm) Class-B Medium as per ISI MARK	Kms.	**Price considered in D.1**
13	Any other component -(Joint closure)	Lumpsum	**Price considered in D.1**
B	**Supply - Passive Infrastructure (Aerial Cable)**		
1	ADSS Optical fibre Cable 24 core ribbon	Kms.	**73,073**
2	24F FTB (Fully loaded including enclosure)	Nos.	**2,831**
3	RCC poles (8 meters) (for Aerial Fibre laying)	Nos.	**2,300**
4	Pole clamping Kit (Aerial Fibre laying)	Nos.	**1,686**
5	Tension Poles, with necessary accessories and foundation	Nos.	**3,279**

Sr. No.	Item Description	UOM	Final Rate for Rectification Work Package – A & B
D	**Services- Passive Infrastructure (As per technical specifications given in Annexure-A TEC GR No. and Engineering Instruction)**		
1	Excavation of trench for HDPE - PLB pipe laying, HDPE-PLB pipe laying, Backfilling, Reinstatement and Compaction after laying of HDPE-PLB pipe.	Kms.	**1,69,000**
2	laying / blowing of optical Fibre Cable inside laid HDPE-PLB pipe	Kms.	**Price considered in D.1**
2.a	96 core unarmoured optical fibre cable (Ribbon) blowing for connectivity planned as feeder cable from OLT / block location to road intersection location (where distribution cable from GP terminates with feeder cable). The cost shall include fixing of joint chamber, manhole, splice closure, Fixing, painting and sign writing of Route /Joint Indicators, termination at FTBFDMS and all the relevant accessories etc. and end to end testing of dark and lit fibre per GP (For Underground laying) (As per the Engineering Instruction issued by BBNL)	Kms.	**Price considered in D.1**
2.b	48 core unarmoured optical fibre cable (Ribbon) blowing for connectivity planned as distribution cable from Road Intersection Location to Village Panchayat (GP) The cost shall include fixing of joint chamber, manhole, splice closure, Fixing, painting and sign writing of Route /Joint Indicators, termination at FTBFDMS and all the relevant accessories etc. and end to end testing of dark and lit fibre per GP (For Underground laying) (As per the Engineering Instruction issued by BBNL)	Kms.	**Price considered in D.1**
2.c	24 Core ADSS Ribbon aerial fibre laying on existing / new poles planned as distribution cable from Road Intersection Location to Village Panchayat (GP) The cost shall include fixing of Poles, splice closure, termination at FTB and all the relevant accessories etc. and end to end testing of dark and lit fibre per GP (For Aerial laying) (As per the Engineering Instruction issued by BBNL)	Kms.	**Price considered in D.1**
3	Splicing and jointing of Optical Fibre Cable including Acceptance Testing, commissioning and makeover of the routes.	Nos.	**Price considered in D.1**
4	Road / bridge crossing, laying of HDPE- PLB inside DWC pipe, wherever required and obtaining Right-of-Way (RoW) permissions.	Kms.	**Price considered in D.1**

Notes:

1. Any consumable items other than mentioned in above existing rates including statement as "price considered in D.1" table required for existing fiber route rectification* the same will be reimbursed based on 90% of discovered rate in BSNL's (BharatNet- ABP Phase-III) tender of BSNL Madhya Pradesh(First Preference), BSNL Rajasthan (Second Preference) and other adjoining states or the tender rate discovery during this RFP, whichever is lower.

* Route rectification applicable only after 100% go-live.

Annexure: XXXXIV- Existing GFGNL Rate Discoveries Of VIP Events

#	Description	UoM	Unit price (w/o Tax) (B)
1	**VIP/Ad-Hoc Events:** Establishment(SITC(Supply, Installation, Testing and Commissioning)) acceptance, Service(labour/transportation, etc.) and recovery(dismentle) Cost to maintain Tempory Connectivity during **VIP / Major/ Ad-Hoc Events** for **Wireline on Fibre**	Nu	14750
2	**VIP/Ad-Hoc Events:**Establishment SITC(Supply, Installation,Testing and Commissioning)) acceptance, Service(labour/transportation, etc.) and recovery(dismentle) Cost to maintain Tempory Connectivity during **VIP / Major/ Ad-Hoc Events** For Wireless **(upto 6 mtr)**	Nu	20060
3	**VIP/Ad-Hoc Events:**Establishment(SITC(Supply, Installation,Testing and Commissioning))acceptance, Service(labour/transportation, etc.) and recovery(dismentle) Cost to maintain Tempory Connectivity during **VIP / Major / Ad-Hoc Events** For Wireless **(above 6mtr)**	Nu	41300

Annexure: XXXXV- List Of MAF Required.

#	List of ~~TSEC needs to review~~ MAF Requirements	Y/N
I.	Technical Specifications for Routers	Y
II.	Technical Specifications for EMS of Routers	Y
III.	Server Hardware Specification	Y
IV.	Technical Specifications for OFC	Y
V.	Technical Specifications for FDMS	Y
VI.	Technical Specifications for Mini-OLT	Y
VII.	Technical Specifications For ONT(Optical Network Terminal) manageable	Y
VIII.	Technical Specifications for CPE (customer premise equipment) L2 manageable switch – 24 ports	Y
IX.	Remote Fibre Management System (RFMS)	Y
X.	Minimum Technical specifications for Uninterrupted Power Supply (UPS) System at GP	Y
XI.	Unlicensed Band Radio (UBR)	Y
XII.	Free Space Optics (FSO) / Light fidelity (Li-Fi)	Y
XIII.	Rack at GP Locations	Y
XIV.	Rack at Sub-Block/Master Block Locations	Y
XV.	Technical Specifications for 8.0/ 7.0-meter long RCC pole working load of 115 Kgs	Y
XVI.	Pole & mast for UBR installation	~~Y~~ N
XVII.	Porta Cabin	Y
XVIII.	SMPS Battery	Y
XIX.	Air Conditioning	~~Y~~ N
XX.	Split air conditioner indoor	~~Y~~ N
XXI.	3-Phase Servo Stabilizer	Y
XXII.	1-Single Phase Servo Stabilizer	Y
XXIII.	Manual -Change Over Switch Specification	~~Y~~ N
XXIV.	Fencing	N
XXV.	Main Gate	N
XXVI.	Fire Suppression System- Clean Agent	Y
XXVII.	Security Fence with Chain Link Fence & Concertina Coil	~~Y~~ N
XXVIII.	FM200 Fire Suppression System-Clean Agent	Y
XXIX.	Geographical Information System (GIS)	Y
XXX.	Network Management System (NMS)	Y
XXXI.	Operations Support System (OSS)	Y
XXXII.	Business Support System (BSS)	Y
XXXIII.	Customer Relationship Management (CRM)	Y
XXXIV.	Helpdesk & Grievance Management	Y
XXXV.	Inventory & Asset Management	Y

#	List of ~~TSEC needs to review~~ MAF Requirements	Y/N
XXXVI.	Hyper Converged Infrastructure	Y
XXXVII.	Leaf switches	Y
XXXVIII.	Desktop Planning Tool	Y
XXXIX.	Inventory Management Tool	Y
XXXX.	Workforce Management (WFM) Tool	Y
XXXXI.	Project Management (PM) Tool	Y
XXXXII.	Depth Measurement Tool	Y
XXXXIII.	Measurement Book (MB) Software Tool	Y
XXXXIV.	Survey with Mobile App	Y
XXXXV.	HOTO with Mobile App	Y

Note:

In case multiple OEMs/products are proposed, the bidder shall submit separate Manufacturer's Authorization Forms (MAFs) for each distinct product/software component. The bidder shall remain solely responsible for end-to-end integration, interoperability, performance, support, maintenance, and compliance of the complete solution.

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