ITI LIMITED

Network Systems Unit
(A Govt. of India Undertaking)
Dooravaninagar. P.O. Bengaluru – 560 016
Tel : **080-25662284, 25650054**
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TENDER DOCUMENT

Ref No: ITI/NSU PROJ/BBNL/A&N /1 **Date: 17 Apr 2021**

TENDER FOR SELECTION OF ADDITIONAL "PROJECT IMPLEMENTATION AGENCY" (PIA) FOR SURVEY, LAYING OF OFC BY WAY OF TRENCHING, DUCT LAYING, PULLING OF OFCABLE, INSTALLATION AND TESTING AND COMMISSIONING OF GPON EQUIPMENT FOR BHARATNET PROJECT IN THE UNION TERRITORY OF ANDAMAN & NICOBAR

The Tender will be received up to 1215 hrs on 22 Apr 2021 and opened on the same date i.e., 22 Apr 2021 at 1530 hrs

GM - Projects (Network Systems Unit)
ITI Limited
F-100, West Wing,
Dooravaninagar, Bangalore-560016

CONTENT

Ref No:ITI/NSU//BBNL/A&N / 1 Date: 17 Apr 21

Network System Unit
ITI Limited
Dooravaninagar, Bangalore – 560016

TENDER FOR SELECTION OF ADDITIONAL "PROJECT IMPLEMENTATION AGENCY" (PIA) FOR SURVEY, LAYING OF OFC BY WAY OF TRENCHING, DUCT LAYING, PULLING OF OFCABLE, GIS UPDATE OF WORK, INSTALLATION AND TESTING AND COMMISSIONING OF GPON EQUIPMENT FOR BHARATNET PROJECT IN THE UNION TERRITORY OF ANDAMAN & NICOBAR

CHAPTER 1 – INTRODUCTION

1.1 The **BBNL** RFP document may please be referred to for the detailed list of Gram Panchayats and the scope of work. It consists of GPON network with Optical Line Terminals (OLT) at Block level and Optical Network Terminals (at ONTs) at Gram Panchayat level. The OLT systems will be installed in BSNL exchanges. OLTs and ONTs will be connected mainly through underground 24F Metal free OF Cable with double HDPE sheath (Loose Tube type).

In specific areas, where underground OFC laying is not feasible, aerial laying is permitted. GPON network will be connected to BBNL NOC through an Optical Transport Network through Optical Backbone. The work consists of Route Survey for finalization of OFC routes (Underground or Aerial), Planning of Network, Trenching, OFC laying, Installation, testing & commissioning of OFC GPON network, Procurement of PLB HDPE Duct, OFC, GPON & associated equipment (**including solar photovoltaic system etc.**) as per the specifications.

1.2 As part of implementation of BharatNet Phase II project in Andaman & Nicobar issued a RFP vide ref. NIT No**:** BBNL/MM/PIA for BharatNet Project/Andaman & Nicobar/2020/004 dated 18-05-2020. The RFP documents, clarifications issued by BBNL to the Bidders and addenda to the RFP (and its addendums) can be accessed at https://bbnl.nic.in/tenderarchieves.

1.3 For the purpose of execution of the OFC laying work, a Network consist of 3 District, 7 Blocks and 66 GPs as per **ANNEXURE-I (A) and Annexure-I (B). 40% of the total scope of work will be awarded to selected vendor.**

1.4 ITI now invites tenders from interested Project Implementation Agency "PIA" ("Bidders") to execute OFC laying of BBNL project, including survey, laying of OFC by way of trenching, duct laying, pulling of OF Cable or through Overhead OFC laying, Installation and Testing and Commissioning of GPON equipment for BharatNet Project in the Union Territory of Andaman & Nicobar as per terms and conditions of RFP vide ref. NIT No**:** BBNL/MM/PIA for BharatNet Project/Andaman & Nicobar/2020/004 dated 18-05-2020 and can be accessed at https://bbnl.nic.in/tenderarchieves.

CHAPTER 2 – ELIGIBILITY CONDITIONS FOR THE BIDDERS

2.1 The Bid can be submitted by a Sole Bidder. The Bidder must be an Indian registered company and GST registered and should have at least 3 years of operations in India as on bid submission date.

2.2 The bidder's Average Annual Financial **Turnover** of at least Rs. 2 Cr. during the last 3 audited financial years (2017-18, 2018-19 and 2019-20) ending 31st March-2020.

2.3 The Bidder should be a profit making company in each of the last three years.

2.4 The Bidder should have positive net worth as of 31st March 2020.

2.5 Audited and certified financial statements, including Audited Annual Reports shall be submitted as proof for eligibility conditions as above.

2.6 The Bidder should have an experience of underground OFC laying of at least 250 km. in the last three financial years (2017-18, 2018-19 and 2019-20). Documents in the form of certificates from customers for having executed the underground OFC laying work shall be submitted as part of the bid.

2.7 The Bidder shall have at least 5 numbers of HDD machines/ 10 No's JCBs, trenching machines, or any combination, Cable blowers, splicing machines, OTDRs and other necessary tools/ instruments to complete OFC laying work in all respects end to end. These shall be either owned or hired. If equipment's are owned, a self-certified letter shall be submitted in company's letterhead showing the list of machines & qtys owned by company. In case of hiring, the Bidder shall submit a copy of the Agreement between the Bidder and the Agency from whom the machines are hired, showing the list of machines & qtys as part of the bid document.

2.8 The Bidder should not have been black listed/debarred by any Govt. department or any PSU in India during last three (3) years as on bid submission date. An undertaking in the company letter head shall be submitted by the Bidder as per **Annexure-XIV**.

2.9 Bidder should submit Solvency Certificate valued at least Rs.2 Cr from any scheduled bank issued within 6(six) months from the Tender submission date.

2.10 The Bidder should have experience of Installation & Commissioning of 30 No's of ONT and 4 No's of OLT related GPON equipment's during last 3 years. An appropriate certificate in this respect should be submitted.

CHAPTER 3 – SCOPE OF WORK

3.1 Site survey of OLT and ONT sites within the locations awarded to the Bidder for their readiness for installation of OLT and ONT. OLT sites are in BSNL exchanges and the ONTs are normally to be installed in Gram Panchayats. (ONT locations might vary as per the instructions of BBNL). The activity shall include preparation of checklist, verifying the readiness of sites for commissioning of OLTs/ONTs, liaise with BSNL and GP authorities for getting the site ready etc. The work also includes survey of BSNL laid OF route and defining quantity for usable route length for the portion already completed by BSNL.

3.2 Project implementation agency shall complete detailed site survey of each block and shall propose Network design for each block with detailed BoM for material and services. BBNL or BBNL appointed TPA shall approve the design and BoM based on the confirmation of minimum available dark and lit fiber per GP.

3.3 Conducting Site survey/ Route survey for the entire OFC laying route and preparation of report for the approval of ITI and BBNL. Approval from ITI/BBNL is mandatory to start the OFC laying work.

3.4 Preparation of applications for RoW permits from concerned agencies for laying of OFC and submit them to the agencies after approval from ITI and BBNL. The selected Bidder shall also get the RoW permissions in time from concerned agencies such that there is no hold up in the OFC laying work. ITI, along with BBNL, will extend necessary help in this regard. Any charges applicable for getting RoW permits shall be paid by the PIA and the same shall be reimbursed on submission of original payment receipts, on getting reimbursement from BBNL.

3.5 Establishment of at least one warehouse in each District for storing the materials, like, OFC, duct etc. The Bidder shall establish and maintain the warehouse(s) with security back up and insurance coverage for the temporary storage of materials required for OFC laying work. A proof for having set up the warehouse(s) shall be submitted by the Bidder to ITI within 15 days of ITI's Purchase Order.

3.6 Supply of major materials required for the OFC laying and I&C part of GPON project, like, OFC, HDPE duct, FDMS, 1:4 Splitters, Fibre Patch cords, Joint Closure, GPON OLT and ONT equipment responsibility of ITI, Rest of all other required material for execution of the work will be responsibility of bidder. However, the Bidder shall submit delivery plan for the supply of these materials, within 15 days of placing Purchase Order by ITI.

3.7 Supply of Balance materials/ arranging test equipment's required for OFC laying and commissioning and I&C of GPON equipment shall be the responsibility of the Bidder. This will include Jointing Chambers, Route Marker, Main Hole Marker, GI/DWC pipes, RCC poles, Tension Poles, Suspension Poles, Pole mounting kits, Power cables for connecting OLTs/ONTs, OTDRs, Smart Phones for ABD data capture and upload to NOC, laptops for OLT/ONT commissioning and any other items required for completing the work and commissioning the network. If desired by BBNL, the Bidder shall be ready to submit Manufacturer's Authorization Form (MAF) to BBNL from the OEM of the materials, for specific items that will be sourced by the Bidder for the project. Further, if BBNL desires that such third party materials are required to be tested for manufacturing quality at manufacturer's site, the Bidder shall facilitate testing and acceptance of the materials at manufacturer's site before delivery to sites.

3.8 The Bidder shall keep an accurate log book for receipt and utilization of materials at his/her warehouse(s) for the materials delivered by ITI's vendors as well as those vendors identified by the Bidder. Receipt of materials shall be certified jointly by ITI Engineer as well as Bidder's authorized person for every receipt. ITI shall have the right to verify the material stock at any time.

3.9 Laying of underground and aerial OFC by way of Trenching, Duct laying, pulling of OF cable, splicing and termination in FDMS.

3.10 Testing of end to end connectivity of all Fibre cores in the OFC after laying.

3.11 Uploading as Build Diagram (ABD) data of OFC laying to GIS platform when OFC laying work is concerned, on daily basis, Mapping of OF Cable Route created, including those existing details with ABD Diagrams and providing data in required format (SHAPE or SHP) for incorporation in BBNL GIS Tool, which shall be loaded to the mobile handsets of the selected bidder's inspection personnel Mobile handsets (android or iOS powered, shall be arranged by the Bidder).

3.12 Testing and integration of GPON OLT and ONT. The Bidder shall have sufficient manpower resources for this type of technical work. ITI, however, can extend assistance for commissioning a couple of OLT and ONT equipment and provide training to the Bidder's staff on GPON OLT/ONT commissioning.

3.13 Commissioning of OFC laying, GPON OLT & ONT GP-wise through acceptance testing by Third Party Auditor or any other Agency appointed by BBNL.

3.14 The Bidder shall be responsible for preparing the Bill of Quantities for the materials to be supplied by ITI as well as for the materials to be procured by the Bidder for project execution (excluding the materials/equipment's required for testing) for his/her work, and the same shall be submitted to ITI within 15 days of ITI's Purchase Order. This shall also include the delivery plan for the materials to be supplied by ITI.

3.15 Safe custody of all materials with insurance coverage for all the materials supplied and commissioned until the site is taken over by BBNL shall be the responsibility of the Bidder.

3.16 The Bidder is deemed to have read and understood the project requirements as per the BBNL RFP, including all the clarifications and addenda issued by BBNL, vide Tender No: BBNL/MM/PIA for BharatNet Project/Andaman & Nicobar/2020/004 dated 18-05-2020 and can be accessed at https://bbnl.nic.in/tenderarchieves.

3.17 The specifications of the materials to be supplied by the Bidder shall be as per that given in BBNL tender.

3.18 Execution PLAN, DESIGN, IMPLEMENT AND COMMISSIONING PHASE in **ANNEXURE-II(A)**

3.19 The specifications and engineering instruction for underground OFC laying work are given in **ANNEXURE-II(C)**

3.20 The specifications and engineering instruction for overhead (Aerial) OFC laying are given in **ANNEXURE-III**

3.21 The specifications for OLT, ONT and Installation & Commissioning at Block and Gram Panchayat are given in **ANNEXURE-XIII**

3.22 Scope of work and Technical Specifications of GIS mapping of OFC Routes for BHARATNET **Given in ANNEXURE-II(B)**

3.23 The delivery terms, payment terms and penalties are shown in **Chapter-4**

3.24 General Instructions to the Bidders are shown in **Chapter-6**

3.25 The Specifications shown in this Tender are indicative. The specifications and quality of service are governed by the BBNL RFP, its addenda and the clarifications issued by BBNL on the RFP.

CHAPTER 4 – WORK ALLOCATION, DELIVERY, PAYMENT TERMS AND PENALTIES

AWARD OF CONTRACT & DISTRIBUTION OF WORK:

4.1 Price list for this work is already mentioned in this tender in section 5.19: Bid prices. Hence vendor have to submit his willingness to carry out the work as per the prescribed rate only.

4.2 Priority for the award of contract to bidders will be given in the following order

4.2.1 **Priority 1:** Bidder participated in ITIL tender bid for BharatNet project for Union territory Andaman & Nicobar Ref No: ITI/NSU/BBNL/A&N / 130 dated 25 Sep 2020.

4.2.1.1 If Multiple Bids are received, priority is given based on meeting the financial eligibility criteria in the above tender. i.e. L2 will have more priority that L3 and L3over L4 and so on.

4.2.2 **Priority 2:** OSP vendors working / worked with ITIL in any of the OSP fiber laying projects, without any negative remarks

4.2.2.1 Priority will be for the OSP's who have completed more route length Trenching & Duting in KMS.

4.2.3 **Priority 3:** Other OSP vendors with OSP work experience in Andaman & Nicobar island.

4.2.3.1 Priority will be for the OSP's who have completed more route length Trenching & Ducting in KMS in Andaman & Nicobar island.

4.2.4 **Priority 4:** All other OSP vendors

4.2.4.1 Priority will be for the OSP's who have completed more route length Trenching & Ducting in KMS.

4.3 Approximately 40% of total scope of work (item wise) of the project will be given to the selected vendor. Total scope of work of the project is **320** KMs of OFC laying and commissioning corresponding OLTs and ONTs. In case of award of work to more than one bidder, efforts shall be made to award higher portion of work to the bidders better in price bid ranking. However, the Tender being for a service and not for the supplies, the exact ratio of work and choice of area may not be met despite of all efforts. Accordingly, no PIA shall have any right to claim on Jurisdiction or Quantum of work.

4.4 Should there be an eventuality that the pace of progress is not coming from the deployed PIA(s) and the LDs are mounting towards outer limits, ITIL shall resort to awarding the whole or part of such work to alternate PIA at Risk & Cost which may be chosen from amongst the bidders who were technically qualified in the process of this very tender under consideration or by inviting separate competitive financial bids for such pending work from such interested companies. Cost escalation if happens in this process, shall be recoverable from the faltering PIA(s).

4.5 Delivery

4.5.1 Time is the essence of the project. As per BBNL timelines, the project is required to be executed as per the delivery timelines for OFC laying and GPON equipment commissioning are shown in **Annexure-V.**

4.6 Payment Terms

4.6.1 No advance payment shall be applicable for any Bidder.

4.6.2 The payments shall be released only on satisfactory acceptance of the deliverable for each task

as per the Schedule given in **Annexure-IV**

4.6.3 The following documents shall be submitted along with bills for payment for End to End connectivity of GPs:

4.6.3.1 Installation & Commissioning and Testing report verified and recommended by TPA and approved by State Head, BBNL
4.6.3.2 OTDR/Link Test Report, Power On, post.
4.6.3.3 FINAL AT report and Certificate issued along with configuration reports verified and recommended by TPA and approved by State Head, BBNL.
4.6.3.4 As Built Diagram(ABD) Report, Monthly Progress Report and related document as per RFP.

4.6.4 The first Bill shall be raised only after completing the end to end connectivity of 10% of total GPs.

4.6.5 Subsequent bills may be raised for the completed GPs as per the completion schedule and payment terms and condition of Tender.

4.6.6 An amount of 7.5% of each bill will be retained as security Deposit. The same will be released after defect liability period of 12 months or one year after Go Live of the project whichever is later.

4.7 Liquidated damages and Penalties:

4.7.1 The PIA shall perform the Services and comply in all respects with the critical dates and the parties hereby agree that failure on part of the PIA to meet the critical dates without prejudice to any other rights that the Purchaser have, may lead to the imposition of such obligations as are laid down in the Delay and Deterrent Mechanism and/or levy of penalty as set and/or termination of the Contract at the discretion of the Purchaser.

4.7.2 Penalties shall be capped to maximum of 15% of total cost of Project Value. Beyond 15% the Purchaser has the right to terminate the contract or a portion or part of the work thereof. The purchaser shall give 30 days' notice to the PIA of its intention to terminate the Contract and shall so terminate the Contract unless the Bidder initiates remedial action acceptable to the Purchaser during the 30 days' notice period.

4.7.3 ITI Limited may without prejudice to its right to effect recovery by any other method, deduct the amount of liquidated damages from any money belonging to the PIA in its hands (which includes the ITI Limited's right to claim such amount against PIA s' Bank Guarantee) or which may become due to the PIA. Any such recovery or liquidated damages shall not in any way relieve the PIA from any of its obligations to complete the Works or from any other obligations and liabilities under the Contract.

4.7.4 Delay in execution of the work, if attributable to the Bidder, shall attract Liquidated Damages as per the details shown at **ANNEXURE-V**

4.7.5 The maximum LD will be limited to 15% of the Purchase Order value.

4.7.6 Additional penalties shall be applicable for deficiency and deviation from Standard Engineering Instruction in the quality of work on OFC laying as per the penalty details shown in the BBNL RFP attached in **ANNEXURE-VI**

4.7.7 Additional penalties shall also be applicable if any other expenditure, due to poor quality of work observed up to 12 months after completion of the total work as per ITI's Purchase Order and the same will be recovered from Bidder before releasing their PBG/ Security Deposit.

CHAPTER 5 – BID FEES AND BID SUBMISSION AND OTHER TERMS
INSTRUCTIONS TO BIDDERS

5.0 Invitation to Bid:

Bids are invited from companies/ firms to participate in this Tender for Selection of "Project Implementation Agency" (PIA) for survey, laying of OFC by way of trenching, duct laying, pulling of OFCable, Installation and Testing and Commissioning of GPON equipment for BharatNet Project in the Union Territory of Andaman & Nicobar, who meet the minimum eligibility criteria as specified in this Tender.

5.1 Bid Preparation Costs

5.1.1 The bidder shall be responsible for all costs incurred in connection with participation in this Tender process, including, but not limited to, costs incurred in conduct of informative and other diligence activities, participation in meetings/discussions/presentations, preparation of bid, in providing any additional information required by the ITI to facilitate the evaluation process, and in negotiating a definitive contract or all such activities related to the bid process.

5.1.2 ITIL shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

5.2 Authentication of Bid

A bid should be accompanied by a power-of-attorney in the name of the signatory of the bidder.

5.3 Bid Submission

5.3.1 ITI's Tender document can be downloaded from ITI web site www.itiltd.in or CPP portal www.eprocure.gov.in The hard copy of the Tender document is not available for sale by ITI.

5.3.2 Tender document fee of Rs. 5,000/- (Rupees Five Thousand Only) plus GST @18% (Total Rs. 5,900/-) shall be payable with the bid. This shall be submitted as a Demand Draft or through NEFT or bank transfer or Pay Order drawn at a Scheduled Bank/Post Office in favor of ITI Limited (N S UNIT), Dooravani Nagar, Bangalore - 560016, along with the bid document. The MSME bidders shall be exempted from the bid document fee. The Bank details for crediting/Transferring money to ITIL is as below.

Account No: 38779898110
Bank: State Bank of India
Branch: Dooravaninagar
IFSC Code: SBIN0001438

5.3.3 The Tender document fee is non-refundable.

5.3.4 Bid shall be valid for at least 90 days from the date of Bid opening.

5.3.5 EMD is not required for this tender as per the Government of India Ministry of finance procurement policy division office memorandum dated 12 Nov 2020. However, bidder has to submit duly signed bid security declaration as per the Annexure XV

5.3.6 The successful bidders shall submit a Performance Bank Guarantee (PBG) from a Scheduled Bank to ITI for an amount equal to 3% of the work awarded valid for two years. The PBG should be submitted latest

within 7 days from the date of ITI's requisition (LOI). The validity of the PBG shall be extended in case of the extension of original delivery time lines of the project.

5.3.7 Bids in prescribed format shall be submitted through e-tendering process

5.3.8 The financial bid/quote at any other place than designated, will make the bid liable for rejection.

5.4 Important Information:

Sl. No.	Information	Details
1	Tender Number	Ref No: ITI/NSU PROJ//BBNL/A&N /01 Dated 15 Apr 2021
2	Tender Name	Tender for Selection of **"Project Implementation Agency" (PIA)** for survey, laying of OFC by way of trenching, duct laying, pulling of OF Cable, GIS update, Installation and Testing and Commissioning of GPON equipment for BharatNet Project in the Union Territory of Andaman & Nicobar
3	Work description/Nature of the work	For survey, laying of OFC by way of trenching, duct laying, pulling of OF Cable, GIS update in BBNL server, Installation and Testing and Commissioning of GPON equipment for BharatNet Project in the Union Territory of Andaman & Nicobar (End Customer-BBNL)
4	Date of Issue/Publishing of the Tender	17 Apr 2021
5	Clarifications on Tender	Up to 20 Apr 2021
6	Last Date and Time for Submission of Bids	22 Apr 2021, 12:15 Hrs
8	Date and Time of Opening of Technical Bids	22 Apr 2021, 15:30 Hrs
9	Date and Time of Opening of Financial/Commercial Bids of Technical suitable bidders	22 Apr 2021 at 15:30 Hrs. If any change in the date and time, the same will be informed accordingly.
10	Tender Fee	Rs. 5,900/-(Rupees Five Thousand Nine Hundred only)
11	EMD	Not required. Bid security declaration to be submitted
12	Solvency Certificate	Rupees 2 Crore from any scheduled bank issued within 6(six) months from the Tender submission date

13	Bid Validity	90 Days
14	Validity of the contract	One Year (extendable)
15	Attachments/Annexures	Formats and Specifications
16	Tender issuing Authority	General Manager – Projects (NSU), NS Unit, ITI Limited, Dooravaninagar, Bangalore – 560016

5.5 CLARIFICATIONS:

Bidders desirous of seeking clarifications on the Tender may send their queries through email to:

vbs_nsu@itiltd.co.in

5.6 On the Bid opening day, only technical bids will be opened.

5.7 Bids without authenticated proof of Bid document fee, EMD and other technical compliances as required and prescribed in this Tender, will be rejected.

5.8 The address for all correspondences regarding this Tender shall be:

General Manager – Projects(NSU)
NS Unit, ITI Limited
F-100, West Wing,
Dooravaninagar,
Bangalore-560016
E-mail: vbs_nsu@itiltd.co.in

5.9 The offers prepared by the Bidders and all the correspondences and documents relating to the offers submitted/exchanged by the Bidder, shall be written in English language.

5.10 ITI reserves the right to suspend or cancel the Tender process at any stage, or to accept, or reject any, or all offers at any stage of the process and / or to modify the process, or any part thereof, at any time without assigning any reason, without any obligation or liability whatsoever and the same shall be published in the ITI website or intimated through email.

5.11 The Bidder shall bear all costs associated with the preparation and submission of its Tender, including cost of presentation for the purpose of clarification of the offer, if so desired by ITI.

5.12 At any time prior to the last date for receipt of offers, ITIL, may, for any reason, whether at its own initiative or in the response to a clarification requested by the prospective bidders, modify the Tender document.

5.13 Also, ITI may, at its discretion, extend the last date and time for the receipt of offers and/or make other changes in the requirements set out in the Invitation for Tender at its own accord or in order to provide reasonable time to bidders to take the amendments into account in preparing their offers.

5.14 If the last day for the bid submission is declared as a holiday, the bid will be opened at the same time on the next working day.

5.15 Tender will be received/submission up to 12:15 Hrs. on 22 Apr 2021 and technical bid will be opened on same day i.e 22 Apr 2021 at 15:30 Hrs.

5.16 Commercial bids of technical suitable bidders will be opened on 22 Apr 2021 at 15:30 Hrs. If any change in the date and time, the same will be informed accordingly.

5.17 BID PRICES:

5.17.1 The bidder shall submit willingness to work as per the rate mentioned below. The item wise price inclusive of all incidentals and inclusive of all taxes and levies but exclusive of Goods and service tax. Goods and Service tax shall be paid extra, as applicable. The PIA shall be responsible for loading/unloading and transporting the materials, from ITIL/Customer's store to the work site.

5.17.2 The PIA shall maintain minimum one local Stocking Arrangement (Warehouse) at the site to safely stock the installation material issued from the customer's issue point which shall be one per Circle. The safety and security of all material since by the customer/ITIL, till handing over, shall solely be of PIA.

5.17.3 The bidder shall provide acceptance against all the items of the chosen Area/City. Bids not having quote for all the items/components as per the financial bid format, essential or allied, shall be termed as incomplete and liable for rejection.

5.17.4 Bid prices not to exceed the given ceiling price below. Bill Material with Ceiling of price

BILL MATERIAL WITH CEILING OF PRICE

S. No	**Item Description as per Technical Specifications**	**Unit**	**Approx. Qty**	Rates Per KM (Rs)	Itemized Bid Value
	Passive infrastructure:		**(A)**	**B**	X=A*B
1	Excavation of trench for PLB pipe laying, PLB pipe laying, Back filling, 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 with GIS Mapping and Acceptance Testing, Commissioning and makeover of the routes. The work also includes road / bridge crossing, laying of PLB inside DWC pipe, wherever required and obtaining Right of-Way (RoW) permissions. Commissioning of 24 core optical fibre connectivity from the Block PoP to GP room and termination at GP ONT.	Km	130	2,69,325.00	3,50,12,250
	Active infrastructure:				
2	Installation and commissioning of Electronics at Block (OLT) and integration with Existing EMS or New EMS	Nos	4	6,982.50	27,930
3	Installation and commissioning of ONT &Associated equipment and integration with BBNL NOC	Nos	30	5,985.00	1,79,550
	Solar Panel (Power) (As per technical Specifications given in Annexure-ATEC GR No.) Material and Services:				
4	Installation, integration and commissioning of Solar Photovoltaic Power Supply including Solar Power Panel, VRLA Batteries, Charge Controller Unit (along with the suitable stand,Earthing and installation materials)	Nos	30	9,975.00	2,99,250
Approximate Total Bid Value of work (Excluding GST) In Rs.				**3,55,18,980**	

5.18 PERIOD OF VALIDITY OF BIDS:

5.18.1 Bid shall remain valid for 90 days from date of opening of the bids (Qualifying Bid). A Bid valid for a shorter period shall be rejected by ITIL as non-responsive.

5.18.2 In exceptional circumstances, the tendering authority may request the consent of the bidder for an extension to the period of bid validity. The request and the response thereto shall be made in writing. In such cases, the bid security provided shall also be suitably extended. The bidder may refuse the request without forfeiting its bid security. A bidder accepting the request and granting extension will not be permitted to modify its bid.

5.19 SIGNING OF BID:

5.19.1 The bidder shall prepare, as a part of his bid, the bid documents duly signed on each and every page establishing the conformity of his bid to the bid documents of all the works to be executed by the bidder under the contract. E-tender bid process to be followed

5.19.2 The bid shall contain no inter-lineation, erasures or overwriting except as necessary to correct errors made by the bidder in which case such corrections shall be signed with dated by the person or persons signing the bid.

5.20 Disclaimer:

5.20.1 ITI and/or its officers, employees disclaim all liability from any loss or damage, whether foreseeable or not, suffered by any person acting on or refraining from acting because of any information including statements, information, forecasts, estimates or projections contained in this document or conduct ancillary to it whether or not the loss or damage arises in connection with any omission, negligence, default, lack of care or misrepresentation on the part of ITI and/or any of its officers, employees.

5.20.2 All information contained in this Tender provided / clarified is in good faith and interest. This is not an agreement and is not an offer or invitation to enter into an agreement of any kind with any party.

5.20.3 Though adequate care has been taken in the preparation of this Tender document, the interested bidders shall satisfy themselves that the information contained in the document is complete in all respects to enable to make an informed decision to bid. Interested Bidders are required to make their own enquiries and assumptions wherever required.

5.20.4 **Information provided in this document or imparted to any respondent as part of the Tender process is confidential and shall not be used by the respondent for any other purpose, distributed to, or shared with any other person or organization**

5.20.5 Bid received / submission after due date and time will not be considered.

5.23 LIST OF DOCUMENTS TO BE SUBMITTED AS A PART OF THE BID

Check list of documents/information to be submitted with the bid:	
a.	Bidder's Profile.
b.	Certificates of Incorporation.
c.	Memorandum & Articles of Association.
d.	Audited financial statements for the last 3 years. (2017-18, 2018-19 & 2019-20) and CA certificate in case of Unaudited report of 2019-20 with an undertaking to submit the audited report, soon it is available.
e.	Certificate from Statutory Auditor/CA specifying the Annual Turnover from Telecom Infrastructure services during last three years (2017-20).
f.	EMD not applicable. Bidder has to submit duly signed Bid-securing declaration. Format enclosed in Annexure XV
g.	Experience Certificates: Work Order / Agreements of the Project along with completion certificates clearly highlighting Scope of the Work (SOW), Bill of Material (BOM), cost of the Project(s) with specific mention of the cost towards OFC laying (Underground / Aerial) and I&C of GPON Equipment's. The experience as required to meet eligibility conditions during the last 3 years only (period ending 31st March 2020), shall be considered.
h.	Positive Net Worth Certificate for the last 3 years (2017-20).
i.	Solvency Certificate from the banker for the minimum amount of Rs.3 Cr from any scheduled bank issued within 6(six) months from the Tender submission date
j.	GST Registration Certificate.
k.	Copy of PAN Card.
l.	CIN (Corporate Identity Number).
m.	Self-declaration in **Annexure-XIV.** non barring from business on account of blacklisting etc.
n.	Authorization letter in the company letterhead authorizing the person signing the bid for this Tender and Power of Attorney (POA).
o.	Clause by clause compliance to all the terms and conditions.
p.	Undertaking in letter head to indemnify ITI from any claims / penalties / statutory charges, liquidated damages, with legal expenses etc.
q.	NDA (Non-Disclosure Agreement) as per **Annexure-XII**
r.	Pre-Contract Integrity Pact **Annexure –IX**
s.	A detailed exhibit on the "Approach and Methodology", bidder proposes to adopt if the project is awarded to it,
t.	List of Tools & Implements owned by the bidder such as JCB, HDD M/Cs, Splicing Machines etc.
u	Self-certified list of Employees with EPF & ESI Details.
v	An undertaking to submit PBG along with LOI acceptance for 3 % of the order value valid through defect liability period within 15 days' time.
w	All other docs as mentioned in this Tender elsewhere.

Note:

ITIL or its nominee reserves the right to cross check / validate the authenticity of the documents submitted and the information provided in the Pre-qualification and Eligibility criteria. The requisite support to prove the claims must be provided by the Bidder failing which the supporting document shall be taken as not proved followed with attached consequences of false claim.

CHAPTAR 6 - GENERAL CONDITIONS OF CONTRACTS

6.1 DEFINITION AND INTERPRETATIONS:

6.1.1 GENERAL:

In this general conditions of contract, the following terms shall have the meaning hereby assigned to them except where the context otherwise requires.

6.1.2 COMPANY:

Company shall mean ITI LIMITED, Network Systems Unit having its registered office at Bengaluru.

6.1.3 MANAGEMENT:

Management shall mean the officer nominated by the Company to deal with the matters pertaining to the contract. The Officer so nominated shall be intimated to the Bidder after the acceptance of the contract.

6.1.4 ADDITIONAL GENERAL MANAGER (AGM):

6.1.5 Additional General Manager shall mean the officer in Administrative charge of the project.

6.1.6 CHIEF ENGINEER:

Chief Engineer shall mean the officer-In-charge of the Engineering Department of the Project.

6.1.7 ENGINEER:

Engineer shall mean the Chief Engineer / Chief Manager, Deputy Chief Engineer / Manager, Senior Engineer / Deputy Manager, Executive Engineer / Assistant Manager, Assistant Executive Engineer / Engineer, Asst. Engineer or any other nominee for the execution of the work. The term Engineer- in – Charge shall also have the same meaning as the Engineer.

6.1.8 ENGINEER'S Representative:

Engineer's Representative shall mean the Assistant Engineer in Direct charge of the works and shall include any Junior Engineer/ Construction Assistant /Junior supervisors etc., appointed by the Company.

6.1.9 BIDDER:

'Bidder' shall mean the person, firm or company who has entered into agreement for the execution of works and shall Include their executor's, successor's, administrator's and permitted assigns.

6.1.10 CONTRACT:

Contract shall mean the contract documents collectively, comprising agreement, Notice Inviting Tender, General terms and conditions, special terms and conditions, specifications, Time schedule of works, information and instructions to tenderers, accepted schedule of rates, and other documents and drawings constituting the tender and accepting thereof.

6.1.11 WORKS:

Work shall mean the works to be executed in accordance with the contract.

6.1.12 SPECIFICATION'S:

Specifications shall mean all directions, provisions and requirements attached to the Contract which pertain to the method and manner of performing the work or works to the quantities and qualities of work or works and the materials to be furnished under the contract for the work or works as may be amplified or modified by the Company or the Engineer during performance of the contract in order to provide for unforeseen conditions or in the best interest of the work or works.

6.1.13 ACCEPTED SCHEDULE:

Accepted Schedule in relation to the Contract means the schedule or schedules or quantities and the rates quoted /modified by the Bidder in respect of which the Tender is accepted.

6.1.14 DRAWINGS:

'Drawings' shall mean the maps, drawings, Plans, and tracings or prints thereof annexed to the contract and shall include any modification of such drawings as may be issued or approved in writing by the Engineer from time to time after survey is carried out by Bidder and duly approved by BBNL.

6.1.15 CONSTRUCTIONAL PLANT:

'Constructional Plant' shall mean all appliances or things of whatsoever nature required for the execution, completions or maintenance of the works or temporary works (as herein after define) but does not include materials or other things intended to form or forming part of the permanent work.

6.1.16 TEMPORARY WORKS:

'Temporary work' shall mean all temporary works of every kind required for the execution, completion or maintenance of the works.

6.1.17 SITE:

'Site' shall mean the lands and other places on or through which the works are to be carried out and any other lands or places provided by the company for the purposes of the contract.

6.1.18 PERIOD OF MAINTENANCE:

12 months from the date of final completion of contract under defect liability period.

6.1.19 Letter of Acceptance:

'Letter of Acceptance' is an intimation by a letter to the Tenderer that his/their tender has been accepted in accordance with the provisions contained in that letter.

6.1.20 APPROVED:

'Approved' means approved in writing by the Engineer including subsequent written confirmation of previous verbal approval and Approval means approval in writing including as aforesaid.

6.1.21 CONTRACT VALUE:

'Contract value' means the sum accepted or the sum calculated in accordance with the prices accepted in the tender and/or the contract rates as payable to the Bidder for the entire execution and full completion of the work.

6.1.22 WORK ORDER:

'Work Order' shall mean the order in writing by the Engineer, intimating the Bidder to commence the work wholly or partly, showing the date of commencement and completion of the work as a whole or the part so ordered to be commenced.

6.1.23 DATE OF COMMENCEMENT:

'Date of Commencement' is the date or dates for commencing the whole or part of the work as set out in or ascertained in accordance with the individual work orders or any subsequent agreed agreements thereto.

6.1.24 DATE OF COMPLETION:

'Date of Completion' is the date or dates for completion of the whole work as set out in or ascertained in accordance with the individual work orders or the tender documents or any subsequent agreed agreements thereto.

6.1.25 DEVIATION:

'Deviation' order means an order given in writing by the Engineer to effect an alteration in addition to or deduction from the scope or nature of the contract.

6.1.26 ACCEPTING AUTHORITY:

'Accepting Authority' is officer nominated by the management to accept a tender/ tenders up to a particular value.

6.1.27 MONTH:

'Month' shall mean the calendar month of the Gregorian Calendar.

6.1.28 SINGULAR & PLURAL:

6.1.29 Word imparting the Singular number shall also include the plural and vice versa where the context so requires.

6.1.30 HEADINGS & MARGINAL HEADINGS:

6.1.31 The headings and Marginal headings in these General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof, or be taken into consideration in thereof or the context.

6.1.32 MATERIAL WASTAGE:

Maximum 3% wastage of (OFC/Duct) may be allowed.

6.1.33 EXCESS MATERIAL RECOVERY:

The excess material recovery will be made on the material reconciliation.

6.1.34 CABLE CUTS: If there is any failure due to cable cuts vendor is responsible to maintain the network without any additional charge till the project hand over to the BBNL/O&M partner.

6.1.35 In case of damage to other telecom operator's/utilities assets during the fiber laying work.it should be repaired by vendor/incase of penalty, should be borne by the Bidder.

6.2 GENERAL OBLIGATION:

6. 2.1 EXECUTION CORRELATION & INTENT CONTRACT DOCUMENTS:

The Contract documents shall be signed in duplicate by the accepting authority and the Bidder. The contract documents are complementary, and what is called for by any one shall be binding as if called for by all the intention of the documents is to include all Labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work not covered not covered by or property inferable from any heading or class of the specifications shall not be supplied by the company to the Bidder unless distinctly specified in the contract documents. Materials or works described in words which so applied have a well know technical or trade meaning shall be held to refer to such recognized standard.

6.2.2 LAWS GOVERNING THE CONTRACT:

The Contract shall be governed by the laws for the time being in force in the republic of India

6.2.3 Compliance to Regulation & Bye-Laws:

The Bidder shall confirm to the provision of any status relating to the works and regulations and bye-laws of any local authority and of any water and electric companies or undertakings with those system the work is proposed to be connected and shall before making any variations from the drawings or the specifications that may be necessitated by so confirming, given to the Engineer notice specifying the variation proposed to be made and the reason for making the variation and shall not carry out such variation until he has received instructions in writing from the Engineer in respect thereof. The Bidder shall be bound to give all notices required by statute, regulations or Bye-Laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

6.2.4 COMMUNICATION TO BE IN WRITING:

All notices, communications, references and complaints made by the company or the Engineer or the Engineer's Representative or the Bidder INTERSE concerning the work shall be in writing and no notice, communication, reference or complaint not in writing shall be recognized.

6.2.5 SERVICE OF NOTICE ON BIDDER:

The Bidder shall furnish to the Engineer the name, designation and address of his authorized agent and all complaints, notices, communications, and references shall be deemed to have been duly given to the Bidder if delivered to the Bidder or his authorized agent or left at or posted (Registered Post) to the address so given and shall be deemed to have been so given in the case of posting on the day on which they would have reached such address in the ordinary course of post or on the day on which they were so delivered of left in case of hand delivery. In the case of contract by partners, any change in the constitution of the firms shall be forthwith notified by the Bidder to the Engineer with a copy of the accepting authority.

6.2.6 OCCUPATION AND USE OF LAND:

No land belonging to or in the possession of company shall be occupied by the Bidder without the permission of the Company. The Bidder shall not use or to be used, the site for any purpose other than that of executing the works.

6.2.7 ASSIGNMENT OR SUBLETTING OF CONTRACT:

The Bidder shall not assign or sublet the contract or any part thereof or allow any person to become interested therein any manner whatsoever without the special permission of the company, provided always that execution of the details of the works by petty contract under the direct and personal supervision of the Bidder or his agent shall not be deemed to be subletting under this clause. The permitted sub-letting of work by the Bidder could not establish any contractual relationship between the sub-Bidder and the company and shall not relieve the Bidder of any responsibility under the contract.

6.2.8 STORES ARRANGED BY THE BIDDER:

Bidders should arrange stores for materials supplied by company for the said work. The warehouse can use for materials arranged by Bidder as well as those supplied by others. This warehouse should have proper security and insurance coverage. The receipt of materials should be certified jointly by ITI engineer and engineer from the tenderer.

6.2.9 REPRESENTATIVE ON WORKS:

The Bidder shall when he is not personally present on the site of works, place and keep a responsible agent at the works during working hours who shall on receiving reasonable notice, present himself to the Engineer and orders given by the Engineer or Engineer's representative to the agent shall be deemed to have the same force as if they had been given to the Bidder before absenting himself, the Bidder shall furnish the name and address of his agent for the purpose of his clause failure on the part of the Bidder shall render him liable for the consequences mentioned hereafter.

6.2.10 RELICS:

All Gold, Silver, Oil and other materials of any description and all the precious stones, coins, treasure, relics, antiques and other similar things which may be found in or upon the site shall be the property of the company, and the Bidder shall duly preserve the same to such to the satisfaction of the company, and shall from time to time deliver the same to such person or persons as the company may appoint to receive the same.

6.2.11 EXCAVATED MATERIALS:

The Bidder shall not sell or otherwise dispose of or remove except for the purpose of this contract , the sand, Stone, Clay, Ballast, Earth Rock, or Other substances , or materials which may be obtained from any excavation made for the purpose of the works or any building or produce upon the site at the time of delivery of the possession thereof, but all such substances , materials, Buildings, and Product shall be the property of the company provided of course that the Bidder may with the permission of the Engineer use the same for the purpose of the work by payment of the same at such rates as may be determined by the Engineer.

6.2.12 INDEMNITY AND CHARGES:

6.2.12.1 INDEMNITY AND CHARGES PAYABLE:

The Bidder shall indemnify and save harmless the company from and against all actions, suits, proceedings, losses costs, damages, claims and demands of every nature and description brought or recovered against the company by reason of any act or omission of the Bidder, his agents or employees in the execution of the work or in regarding of the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to use of the company without references to the actual loss or damage sustained and whether or not damage shall have been sustained.

6.2.12.2 PATENT RIGHT:

The Bidder shall fully indemnify the company or the agent/ servant or employees of the company, against any action claim or proceeding relating to infringement or the use of any patent or design or any alleged patent or design rights, and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the events of any claims being made or action brought against the company or any agent or servant, or employee of the company or in respect of any of the matters aforesaid the Bidder shall immediately be notified thereof for taking necessary action provided that the payment of indemnify shall not apply when such infringement has taken place in complying with the specific directions issued by the company, but the Bidder shall pay any royalties payable in respect of any such use.

6.2.12.3 OCTROI AND OTHER DUTIES:

All charges on account or Octroi, terminal or GST and/ or other duties or any other levy as the case may be for the materials obtained for the works shall be borne by the Bidder. Rates quoted by the Bidder shall also include the GST on works contract wherever applicable.

6.2.12.4 ROYALTIES:

Except where otherwise specified the Bidder shall pay all tollage and other royalties, rent, and other payment or compensation (If any) for getting stone, sand, gravel, clay, and other material required for the works or temporary works or any of them.

6.2.12.5 Delay and Extension of Time:

If the Bidder has delayed at any time in the progress of the works by any act or neglect of the employees of the company or by any other Bidder employed by the company under Separate Contracts in connection with the Works mentioned in clause no. 3.2.4 , or by strikes, lockouts, fire unusual delay in transportation unavoidable casualties of any cause beyond the Bidder's control, or by delays authorized by the Engineers pending arbitration or by any cause which the Engineer shall decide to justify the delay, then the time of completion of the works shall be extended for such reasonable time as the engineer may decide.

6.2.12.6 Extension of Time on Company Account:

In the event of any failure or delay by the company to hand over the Bidder possession of the lands, necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the company due to any other cause whatsoever, then such failure of delay shall in no way affect or vitiate the contract or alter the character thereof entitle the Bidder to damages or compensation thereof but in any such case extension or extensions of the completion date as may be considered reasonable may be granted to the Bidder.

6.2.12.7 Time to be Essence of the Contract and Liquidated Damages:

The time for completing the works or portions where off by their respect dates or extended dates fixed for their completion shall be deemed to be the essence of the contract, and if the Bidder shall fail to complete the work within the time prescribed, the company shall if satisfied that the works can be completed by the Bidder within a reasonable short time thereafter be entitled, without prejudice to any other right or remedy available on that behalf, to recover by way of ascertained and liquidated, damages, a sum equivalent to as indicated in the below chart attached. If the company is not satisfied that the works can be completed by the Bidders and in the event of failure on the part of the Bidder to complete the works with in the further extension of time allowed as aforesaid the company shall be entitled without prejudice to any other right or remedy available on that behalf, to appropriate the Bidder's security deposit

and rescind the contract under clause 6.8.3 of these conditions, whether or not actual damage is caused by such default. The amount of compensation will be adjusted or set off against any sum payable to the Bidder under this or any other contract provided always that the entire amount of compensation to be paid under this clause shall not exceed 15 % of the contract value as a whole.

Penalties applicable in case of Non-compliance with delivery timelines / Milestone as defined in Project Implementation Schedule for GP Installation is mentioned in **Annexure V**

6.2.13 Illegal Gratification:

Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the Bidder or his partner, agent or servant or anyone on his or on their behalf to any officer, or employee of the company or to any person or his or their behalf in relation to the obtaining or the execution of this or any other contract with the company shall in addition to any criminal liability which may incur, subject to the Bidder to the recession of the contract and all other contracts with company and to the payment of any loss of damage resulting from such rescission, and the company shall be entitled to deduct the amounts so payable from any money due to the Bidder under the contract or any other contracts with the company.
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6.2.14 Everything at Bidder's Risk:

The Bidder shall undertake all risks and liabilities of whatsoever nature arising out of the works Including by way of implications but not by way of limitations all risks attendant on the nature of site, sub-soil, the levels and consistency of strata in or on which the works are to be found or constructed. Also all risk of fire, Earthquakes, riots, war, gales, storms, winds, variations or water level, sub soil and quantities of water to be pumped, discharged of water courses, Rains traffic delays and any other causes of whatsoever nature whether within or beyond Bidder's control, which may affect or damage the works during the construction and all damages which may happen on any way howsoever to the works shall be made good by the Bidder at his own risk and costs.

6.2.14.1 Insurance of work:

Unless otherwise instructed by the accepting authority the Bidder shall on signing the contract insure the works and keep them insured until the virtual completion of the contract against loss or damages by fire and / or earthquake in an office to be approved by the accepting authority in the Joint names of the accepting authority and the Bidder for such amount (Including Consultant fees) as may be called upon to do so by the accepting authority. Such policy shall cover the property of the company and shall not cover any property of the Bidder or of any Sub- Bidder or Employee. The Bidder should deposit the policy and receipts of the premium with the accepting authority within 21 Days from the date of signing the contract unless otherwise instructed by the accepting authority. The default of the Bidder insuring as provided above, the company on his behalf may so insure and may deduct the premiums paid from any sum due, or which may become due to the Bidder. The Bidder shall as soon as the claim on the policy is settled, or the work reinstated by the insurance office should they elect to do so, proceed with all due diligence with the completion of the works in the same manner as though the fire had not occurred and in all respects under the same conditions of contract. The Bidder in case of rebuilding or reinstatement after fire shall be entitled to such extension of time for completion as the Engineer may deem fit.

6.2.15 No Visitor or Photographer:

The Bidder shall neither allow any visitor on the works nor take or allow to be taken any of photographs without the permission of the Engineer in writing.

6.2.16 Work Site Order Book:

The Bidder will be required to keep a properly bound book at site of work as work site order book. The pages of the book will be numbered and initialed by the Engineer. Any special orders and instructions to be issued to the Bidder shall be recorded in this book by the Engineer or his representative and noted it. The book shall be the property of the company.

6.3.0 EXECUTION of WORKS:

6.3.1 Bidder's Understanding:

6.3.1.1 It is understood and agreed that the Bidder has by careful examination satisfied himself as to nature and location of the work, the confirmation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the execution of the works. The general and local conditions, the Labor conditions, prevailing therein and all the other matters which can in any way affect the works under the contract. No claim whatsoever on this account shall be entertained at a later date.

6.3.1.2 Commencement of Works:

The Bidder shall commence the works on the date or dates indicated in the work order in writing to this effect from Engineer and shall proceed with the same with due expedition and without delay.

6.3.1.3 Time and Progress Chart:

A detailed time and progress chart for the execution of various items of work within the overall period of completion shall be prepared jointly by the Engineer and the Bidder, signed by both the parties and shall adhered to.

6.3.2 Compliance to Engineer's Instructions:

6.3.2.1 The Engineer shall direct the sequence in which the several parts of the works shall be executed and the Bidder shall execute without delay all orders given by the Engineer from time to time but the Bidder shall not be relieved thereby from his/their responsibility for the due performance of the works in all respect.

6.3.2.2 Alterations to be authorized:

No alterations in or additions to or omission or abandonment of any part of the work shall be deemed authorized, except under instructions in writing from the Engineer, and the Bidder shall be responsible to obtain such instruction in each and every case.

6.3.2.3 Extra works by another Agency:

Should works over and above those included in the contract be required to be executed at the site, the Bidder shall have no right to be entrusted with the execution of such works which may be carried out by another Bidder or Bidders or by other means at the option of the company.

6.3.2.4 Separate Contracts in connection with the Works:

The Company shall have the right to let out other contracts in connection with the works. The Bidder shall afford such other Bidders reasonable opportunity for the storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs. If any part of the Bidder's work depends for proper results upon execution of the work of another Bidder, the Bidder shall inspect and promptly report to the Engineer and any defect in such work

that render it unsuitable for such proper results and execution. The Bidder's failure to inspect and report shall constitute an acceptance of other Bidder's work as fit and proper for the reception of his work, except as to defects which may develop in the other Bidder's works after the execution of his work.

6.3.3 Instruction of Engineer's Representative:

6.3.3.1Any instruction or approval given by the Engineer's representative to the Bidder in Connection with the works shall bind the Bidder as though it had been given by the Engineer provided always as follows.

6.3.3.1.1 Failure of the Engineer's representative to disapprove any work or materials shall not prejudice the powers of the Engineer thereafter to disapprove such work or materials and order the removal or breaking up thereof.

6.3.3.1.2 If the Bidder shall be dissatisfied by reason of any decision of the Engineer's representative, he shall be entitled to refer the matter to the Engineer who shall there upon confirm or vary such decision.

6.3.4 Adherence to Specifications and Drawings:

6.3.4.1 The whole of the works shall be executed in perfect conformity with the specifications and drawings of the contract. If the Bidder performs any work in a manner contrary to the specifications or drawings or any of them and without such reference to and approval from the Engineer in writing he shall bear all the costs arising or ensuing there from shall be responsible for all loss to the decision.

6.3.4.2. One complete set of Drawings furnished for the work, shall be kept in good condition on the job. This set shall be designated 'Record Prints' A complete and exact record of any and all differences between the work as actually constructed and erected and the design indicated on the design drawings shall be approved by the Engineer in writing before any alterations work is started. All 'Record Prints' will become the property of the company.

6.3.4.3 **Compliance with Bidders and Request for Details:**

The Engineer shall furnish with reasonable promptness after receipt by him of the Bidder's request in writing for the same additional instruction by means of drawings or otherwise, necessary for the proper execution of the works or any part thereof. All such drawings and instructions shall be consistent with the contract documents and be reasonably inferable there from.

6.3.4.4 Meaning and Intent of Specifications and Drawings:

If any ambiguity arises as to the meaning and Intent of any provisions of the specifications and drawings or as to execution or quality of any work of materials of the Engineer thereon shall be final subject to appeal (within 7 days of such decision being intimated to the Bidder) to the Engineer – in –charge who shall have the powers to correct any errors, Omission, or discrepancies

in the specifications, drawings, classifications of work or materials, and those decision in the matter in dispute or doubt shall be final, inclusive and binding.

6.3.5 Work on Holidays and During Night:

The Bidder shall not carry out any work on holidays and between sunset and sunrise without previous permission of the engineer in writing.

6.3.6 Damage to Company's Property and Private Life and Property:

The Bidder shall be responsible for all risk to the works and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or any other property of the Company of the lives, persons connection with the works until they are taken over by the company and this although all reasonable and proper precautions may have been taken by the Bidder, and in case the company shall be called upon to make good any such costs, loss and damages, or to pay compensation (including that payable under the provisions of the workman's thereof) to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omission of the part of the Bidder the amount of any costs or charges(including costs of charges in connection with legal proceedings), which the company may incur in reference thereof shall be charges to the Bidder. The company shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation or legal proceedings being instituted consequent on the action or default of the Bidder, to take such steps as may be considered necessary or desirable to word off or mitigate the effect of such proceeding, charging to the Bidder, as aforesaid any sum or sums or money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payments, defense or compromise and the incurring of any such expenses shall not be called in question by the Bidder. .

6.3.7 Sheds, Store House and Yards:

The Bidder shall at his own expenses provide himself with sheds, Store house, any yards in such situations and in such numbers as in the opinion of the Engineer is requisite for carrying on the works. He shall obtain from the Engineer in writing approval to the layout of the sheds, store houses and the extent of area to be enclosed by the yards, before undertaking constructions thereof.

The Bidder shall keep at each of such sheds, store houses and yards a sufficient quantity of materials and plant in stock as not to delay the carrying out of the works with the due expedition and the Engineer and Engineer's representative shall have the free access to the sheds, store house or yards at any time for the purpose of inspecting the stock of materials or plant so kept in hand and any materials or plant which the Engineer may object to shall not be brought upon or used in the works, but shall be forthwith removed from the sheds, store house or yards by the Bidder. The Bidder shall at his own expenses provide and maintain suitable construction plant like Mixers, Compressors, Welding Sets, Mortar mills and soaking vats or any other equipment necessary for the execution of the works.

6.3.8 Provision of Efficient and Competent Staff:

The Bidder shall place and keep on the works at all-time efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound proper manner and shall employ only such supervisor, workmen and laborer's in or about the execution of any works as are careful and skilled in their various trades and callings.

The Bidder shall at once remove from the works any agent, permitted sub-Bidder, supervisor workmen or laborer who shall be objected to by the Engineer, if any and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him. In the event of the Engineer being of the opinion that the Bidder is not employing on the works a sufficient number of staff and workmen as is necessary for the proper completion of the works within the time prescribed. The Bidder shall forthwith or receiving intimation to this effect take on the additional number of staff and labour specified by the Engineer within seven days of being so required and failure on the part of the Bidder to company to rescind the Bidder under clause 6.8.3 these conditions.

6.3.9 Workmanship and Testing:

6.3.9.1 The whole of the works and /or supply of materials specified and provided in the contract that may be necessary to be done in order to form and complete any part thereof shall be executed in the best and most substantial workman like manner with materials of the best approved quality of their respective kinds agreeable to the particulars contained in or implied by the specifications and as referred to in and represented by the drawings or in such other additional particulars, instructions and drawings as may be found requisite to be given during the carrying on the works and to entire satisfaction of the Engineer according to the instructions and directions which the Bidder may from time to time receive from the Engineer. The materials may be subjected to tests by means of such machines, instruments and appliances as the Engineer may direct and wholly at the expenses of the Bidder.

6.3.9.2 Removal of improper work and material:

The Engineer and the Engineer's representative shall be entitled to order from time to time:

6.3.9.2.1 The removal from the site with the time specified in the order of any materials which in his opinion are not in accordance with the specification and drawings.

6.3.9.2.2 The substitution of proper and suitable materials.

6.3.9.2.3 The removal and proper re-execution (Not withstanding of previous tests thereof or on account payments thereof) of any work which in respect of materials or workmanship is not in his opinion in accordance with the specification, and in case of default on the part of the Bidder in carrying out such orders, the company shall be entitled to rescind the contract under Clause 6.8.3 of these conditions.

6.3.10 Facilities for Inspection:

The Bidder shall afford the Engineer and the Engineer's Representative every facility for entering in upon every portion of the work at all hours for the purpose of inspection or otherwise and shall provide all labour, materials, planks, ladders, pumps appliances and things of every kind for the purpose an Engineer and the Engineer's Representative shall at all times have free access to every part of the works and to all places at which materials for the works are stored or being prepared.

6.3.11 Examination of Work Before Covering Up:

The Bidder shall give notice of not less than 5 days in writing to the Engineer or the Engineer's Representative whenever any work or materials are intended to be covered up in the earth, in bodies or walls or otherwise to be placed beyond the reach of measurement, in order that the work may be inspected or that correct dimensions may taken before being so covered/placed beyond the reach of measurement, in default whereof the same shall at the

option of the Engineer or the Engineer's Representative be uncovered and measured at the Bidder's expenses or no allowance shall be made for such work or material for the purpose of payments.

6.3.12 Temporary Works:

All the temporary works necessary for the proper execution of all the works shall be provided and maintained by the Bidder and subject to the consent of the Engineer shall be removed by him and at his expense when they are no longer required and in such manner as the Engineer shall direct. In the event of failure on the part of the Bidder to remove the temporary works, the Engineer will cause them to be removed and cost as incurred by supervision and other incidental charges shall be recovered from the Bidder. If temporary huts are provided by the Bidder on the company's land which shall at the request of Bidder be allotted by the Engineer in writing for labour engaged by him for the execution of the works. The Bidder shall arrange for handing over vacant possession of the said land after the work is completed, if the Bidder's labour refuse to vacate, and have to be evacuated by the company necessary expenses incurred by the company in connection therewith shall be borne by the Bidder.

6.3.13 Supply of Water and Power:

6.3.13.1 Bidder to Supply water and Power for Works:

Unless otherwise provided for in the contract documents, the Bidder shall be responsible for the arrangements to obtain supply of water and power necessary for the works and his workman.

6.3.13.2 Water and Power Supply for the works:

The Bidders have to make their own arrangement for the water supply and power supply required for carrying out the works at their own cost and the rates may be quoted accordingly.

6.3.14 Property in Materials and Plant:

The materials and plant brought by the Bidder upon the site or on the land occupied by the Bidder in connection with the works and intended to be used for the execution thereof shall immediately they are brought upon the site or the said land, be deemed to be the property of the company, such of them as during the progress of the works are rejected by the Engineer or are declared by him not to be needed for the execution of the works or such as on the grant of the certificates of completion remain un-used shall immediately on such rejection, declaration or grant cease to be the property of the company and the Bidder may then (But not before) remove them from the site or the said land. This clause shall not in any way diminish the liability of the Bidder nor shall the company be if any way answerable for any loss or damages which may happen to or in respect of any materials or plant either by the same being lost, stolen, injured or destroyed by fire, tempest, or otherwise.

6.3.15 Supply of Tools, Plant and Materials:

6.3.15.1 Tools, Plant and Materials Supplied by Company:

The Bidder shall take all reasonable care of all the Tools, Plant and Materials or other property whether of a like description or not belonging to the company and committed to charge for the purpose of the works and shall be responsible for all damage or loss caused by him, his agents or his workmen or others while they are in his charge. The Bidder shall sign accountable receipts for tools, plant and materials made over to him by the Engineer and on completion of the works shall hand over the unused balanced of the same to the Engineer in good order and repair, fair wear and tear accepted and shall be responsible for any failure account for the same or any damage done thereto.

6.3.16 Precautions:

6.3.16.1 Precautions During Progress of Works:

During the execution of works unless otherwise specified the Bidder shall at his own cost provide the materials for and execute all shoring, Timbering and Strutting work as is necessary for the stability and safety of all structures, excavation works and shall ensure that no damages, injury or loss is caused or likely to be caused to any person or property.

6.3.16.2 Roads and Water Courses:

Existing roads or water courses or pipe, electrical lines and conduits shall not be blocked, cut through altered, diverted or obstructed in any way by the Bidder, except with the permission of the Engineer in writing. All compensation claimed for any unauthorized closure, cutting through, alteration, diversion or obstructions to such roads or water courses etc., by the Bidder or his agent or his staff shall be recoverable from the Bidder by deduction from any sums which may become due to him in terms of the contract, or otherwise according to law.

6.3.16.3 Provisions of Access to Premises:

During progress of work in any street or thoroughfare, the Bidder shall make adequate provision for the passage of traffic for securing safe access to all premises approached from such street or thoroughfare and for any drainage, water supply or means of lighting which may be interrupted by reason of the execution of the works and shall erect and maintain at his own cost diversions, barriers, lights and other safeguards as prescribed by the Engineer for the regulation of the traffic and provide watchmen necessary to prevent accidents. The work shall in such cases be executed in night and day if so ordered by the Engineer and with such vigor so that traffic may be impeded for as short a time as possible.

6.3.16.4 Safety of Public:

The Bidder shall be responsible to take all precautions to ensure the safety of the public whether on public of company property and shall post such look out men as may in the opinion of the Engineer be required to comply with the regulations appertaining to the work.

6.3.17 Use of Explosives:

Explosives shall not be used on the works or on the site by the Bidder without the permission of the Engineer in writing and then only in manner and to the extent which such permission is given. When explosives are required for the works they shall be stored in a special mezzanine to be provided at the cost of the Bidder in accordance with the Explosive rules. The Bidder shall obtain the necessary license for the storage and the use of the explosive and all operations in which or for which explosives are employed shall be at the sole risk and responsibility of the Bidder and the Bidder shall indemnify the company in respect thereof.

6.3.18 Suspension of Works:

6.3.18.1 The Bidder shall on the order of the Engineer in writing suspend the progress of works or any part thereof for such times and in such manner as Engineer may consider necessary and shall

during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer.

6.3.18.1.1 If such suspension is provided for in the contract

OR

6.3.18.1.2 Necessary for the proper execution of the works or by reasons of weather conditions or by some default on the part of the Bidder.

OR

6.3.18.1.3 Necessary for the safety of the works or any part thereof, the Bidder shall not be entitled to any extra costs if any incurred by him during the period of suspensions of the works, but in the event of any suspension ordered by the Engineer for Reasons other than aforementioned and when each such period of suspensions exceeds 14 days the Bidder shall be entitled to such extension of time for completion of the works as the engineer may consider proper having regards to the period or periods of such suspensions and such compensation as the Engineer may consider reasonable in respect of salaries or wages paid by the Bidder to his employees during the periods of such suspensions. Bidder shall not resume work or part of work so suspended by the Engineer without a written order from the Engineer to that effect.

6.3.18.2 Suspension lasting more than Three Month:

If the progress of the works or any part thereof is suspended on the order of the Engineer in writing for more than three Month at a time, the Bidder may serve a written notice to the Engineer requiring permission within 15 days from the receipt thereof to proceed with the work or part thereof in regards to which progress is suspended and if such permission is not granted with in that time the Bidder by a further written notice so served may (but is not bound to)elect to treat the suspension where it affects part only of the works as an omission of such part or where it affects the whole of the works as an abandonment of the contract by the company.

6.3.19 Rates for Items of Works:

The rates entered in the 'Accepted Schedule of Rates' of the contract are intended in provide for works duly and properly completed in accordance with the general and special (if any) conditions of contract and the specifications and drawings, together with such enlargements, extensions, dimensions, reductions, alterations or additions as may be ordered in terms of clause 6.4.2.1 of these conditions and without prejudice to the generally thereof and shall be deemed to include and cover superintendence and Labour, supply, including full freight, of materials, of stores, patterns, profiles, moulds fittings, centering, scaffoldings, shoring, props, timber, machinery, derricks, tackle, ropes, pegs, posts, tools, and all apparatus and plant, required on the works, except such tools, plant or materials, as may be specified in the contract to be supplied to the Bidder by the company, the erections to maintenance and removal of all temporary works and buildings all watching, lighting, bailing, pumping, and draining, etc. All prevention of or compensation for trespass, all barriers and arrangements for the safety of the public or of employees during the execution of works, all sanitary and medical arrangements for labour camps as may be prescribed by the company, the setting out of all works and of the construction repair and upkeep of all center lines, bench mark and level pegs thereon. Site clearance, all fees, duties, royalties, rent and compensation to owners for surface damage or taxes and impositions payable to local authorities in respect of land, structures, and all the materials supplied for the work or other duties or expenses for which the Bidder may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract, and all such other incidental charges or contingencies as may have been specially provided for in the specifications.

6.3.20 Demurrage and Wharf Age Dues:

Demurrage charges calculated in accordance with the scales in the force for the time being of the company and incurred by the Bidder failing to load or unload any goods or materials within the time allowed by the railways for loading or unloading as also wharf age charges on materials not removed in time as also charges due on consignments booked by or to him shall be paid by the Bidder, failing which such charges shall be deducted from any sums which may become due to him in terms of contract.

6.3.21 Rates for Extra Items:

If any items of work carried out by the Bidder on the instructions of the Engineer which is not covered by the 'Accepted schedule of rates' (i.e. the Tendered Rates), rates for such additional, altered or substituted work shall be worked out in accordance with the following provisions in their respective order.

i) If the rates for the additional altered or substituted work are not specifically provided in the contract for the work the rates will be derived from rates for similar class of work as are specified in the contract for the work.

ii) If the altered, additional or substituted work included any work for which no rates are specified in the contract then such work shall be carried out at the rates entered in the CPWD Schedule of Rates 2016 (Civil) and the latest Schedule of Rates for Electrical Works, New Delhi minus / plus percentage which the total tendered amount bears to the estimated cost of the entire work put to tender.

iii) If rates for the altered, additional or substituted work cannot be determined in the manner specified in sub clause (i) or (ii) above then rates for such work shall be worked out on the basis of the schedule of rates specified in sub clause (ii) above minus/plus the percentage which the total tendered amount bears to the estimate cost of the entire work put to tender. Provided always that if the rate for a particular part or parts of the items is not in the schedule of rates, the rates for such part or parts will be determined by the Engineer on the basis of the prevailing market rates, when the work was done.

iv) If rates for the altered, additional or substituted work cannot be determined in the manner specified in sub clause (i) to (iii) above, then the Bidder shall within 7 days of the date of receipt of order to carry out the work, inform the Engineer of the rate which it is his intention to charge supported by analysis of the rate or rates claimed and the Engineer shall determine the rates on the basis of prevailing market rates and pay the Bidder accordingly. However, the Engineer by notice in writing will be at liberty to cancel his order to carry out such work and arrange to carry out it out in such manner as he may consider advisable, provided always if the Bidder commences the work or incur any expenditure before determination of the rate(s) herein before mentioned, then in such case the Bidder shall be entitled to be paid in respect of the work carried or expenditure incurred prior to date of determination of the rates as aforesaid to such rate or rates as shall be fixed by the company. But under no circumstances the Bidder shall suspend the work on plea of non-settlement of rates for items falling under this clause.

6.3.22 Clearance of Site:

6.3.22.1 **Clearance** of Site on Completion:

On the completion of the works the Bidder shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and works clean to the satisfaction of the Engineer.

No Final payment in settlement of the accounts for the works shall be made or held to be due to the Bidder till in addition to any other condition necessary for such final payment, site clearance shall have been effected by him and such clearance may be made by the Engineer at the expenses of the Bidder. In the event of his failure to comply with this provision within 7 days after receiving notice to that effect, should it become necessary for the Engineer to have the site cleared at the expense of the Bidder, the company shall not be held liable for any loss or damage to such of the Bidders property as may be on the site and due to such removal therefrom, which removal may be effected by means of public sale of such materials and property or in such a way as deemed fit and convenient to the Engineer.

6.4.0 VARIATION in EXTENT of CONTRACT:

6.4.1 Modifications to the Contract to be in Writing:

In the event of any of the provisions of the contract requiring to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the company and the Bidder. Any verbal or written arrangements abandoning, modifying, extending, reducing or supplementing the contract or any of the term thereof shall be deemed conditional and shall not be binding on the company unless and until the same is incorporated in a formal instrument and signed by the company.

6.4.2 Power of Modifications to Contract:

The Engineer on behalf of the company shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any alterations in their design, character, position, site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof and to order any additional works to be done or any works not be done as provided on clause 6.4.2.2 the Bidder will not be entitled to any compensation for any reductions and for approved materials furnished against a specific order.

6.5.0 Valuation of Variations:

The enlargements extensions, dimensions, reduction, alterations or additions referred to in clause 6.4.2.1 shall in no degree affect the validity of the contract but shall be performed by the Bidder as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressly included and provided for in the specifications and drawings and the amounts to be paid there for shall be calculated in accordance with the accepted schedule of rates and for extra items of works at the rates determined under the clause 6.3.21 of these conditions.

6.5.1 The Bidder shall prepare and furnish to the Engineer once in every month an amount giving full and detailed particulars of all claims for any additional expense to which the Bidder may consider himself entitled and of all extra or additional works ordered by the Engineer which he has expected up to and including the preceding month under the following sub-heads:

a) Deviations from items and specifications provided in contract documents.
b) Extra items of Work.
c) Quantities in excess of those provided in the contract schedule.
d) Items in respect of which the rates have not been settled.

No claim for payment for any such work will be considered which has not been included in such particular.

He should in addition furnish a clear certificate to the effect that the claims submitted by him as aforesaid cover all the claims and that no further claims shall be raised by him in respect of the works done up to and including the period under report.

6.5.1.2 Signing of 'No-Claims' Certificate:

The Bidder shall not be entitled to make any claim so ever against the company under or virtue of entertain or considered any such claim, if made by the Bidder, after he shall have signed "No Claim" certificate in favour of the company, in such form as shall be required by the company.

6.5.1.3 Submission of Bills:

The Bidder shall submit the bills as per time schedule for the completion of the work. The payment shall be made through NEFT/RTGS by the company.

All payments due shall be subject to any deductions which may be made under these presents and shall further be subject to unless otherwise required by clause 6.2.12 of these conditions, **a retention of 7.5 % percent by way of Security Deposit** until the amount of security deposit by way of the retained earnest money and such retention shall total up to the required amount of the security deposit.

6.6.0 MEASUREMENT CERTIFICATES and PAYMENTS:

6.6.1 Quantities in Schedule Annexed to Contract:

The quantities set out in the accounted schedule of rates are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the work to be executed by the Bidder in fulfilment of his obligations under the contract.

6.6.2 Measurements of Works:

The Bidder shall be paid for the works at the rates in the accepted schedule of rates and for extra works at the rates determined under clause 6.3.21 of these conditions on the measurements taken by the Engineer or the Engineer's representative in accordance with rules prescribed for the purpose by the company.

6.6.3 On Account Payments:

6.6.3.1 'On Account' Payment Not Prejudicial to Final Settlement:

'On Account' payments made to the Bidder shall be without prejudice to the final making up of the accounts (except where measurements are specifically noted in the measurement book as 'Final Measurement' and as such have been signed by the Bidder) and shall in no respect be considered or used as evidence of any facts stated in or to be inferred from such accounts nor of any particular quantity of work having been executed nor of the manner of its execution being satisfactory.

6.6.3.2 Manner of Payment:

Payment will be made through NEFT/RTGS

6.6.4 MAINTENANCE OF WORKS:

12 months from the date of final completion of contract under defect liability period.

6.6.5 Certificate of Completion of Work:

6.6.5.1 As soon as in the opinion of the engineer the work shall have been substantially completed shall have satisfactorily passed any final test that may be prescribed, the engineer shall issue a certificate of completion in respect of the works and the period of Maintenance shall commence from the date of such certificate, provided that the engineer may issue such a certificate with respect to any part of the works before the completion of the whole of the works or with respect to any substantial part of the work which has been both completed to the satisfaction of the engineer and occupier or used by the company and when any such certificate is given in respect of a part of the work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of such certificate.

6.6.6 Liability and Obligations:

6.6.6.1 Cessation of Company's liability:

The company shall not be liable to the Bidder for any matters arising out of or in connection with the contract or the execution of the works unless the Bidder shall have made a claim in writing in respect thereof before the issue of the Maintenance certificate under this clause.

6.6.6.2 Unfulfilled Obligations:

Notwithstanding the issue of the Maintenance Certificate the Bidder or/and (subject to clause 6.6.1) the company shall remain liable for the fulfillment of any obligations incurred under the provisions of the Bidder prior to the issue of the Maintenance certificate which remains unperformed at the time such certificate is issued and for the purpose of determining the nature and extent of any such obligation the contract shall be deemed to remain in force between the parties hereto.

6.6.7.0 COMPANY'S LIEN ON ALL MONEYS DUE AND POST PAYMENT CHECK:

The company shall have a lien on and all or any moneys that may become due and payable to the Bidder under these presents and/or also on and over the deposit or security amount or amounts made under the contract and which may become repayable to the Bidder under the conditions in that behalf herein contained for ,or, in respect of any debt sum that may become due and payable to the company by the Bidder either alone or jointly with another or others and either under this and under any other contract or transactions of any nature whatsoever between the company and the Bidder.

The company reserves the right to carry out a post payment audit and/ or Technical examination of the works and the final bills including all supporting vouchers, abstracts etc., and to enforce recovery if as a result of such examination, any over-payment is discovered in respect of any work done by the Bidder or alleged to have been done by him under the contract and such recovery will be made by the company from the Bidder by any or all of the methods presented above. If on the other hand any under payment is discovered the amount shall be duly paid to the Bidder by the company. Further the company reserves the right to make such recoveries and adjustment notwithstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute

before any arbitrator appointed under the arbitration clause of the contract and notwithstanding the fact that the amount of the final bill figures in the Arbitrators award. And further unless the Bidder pays and clear the claims of the company immediately on demand, the said debit or sum by the Bidder from the moneys, securities or deposit which may have become or will become payable to the Bidder or under these presents or under any other contract or transactions whatsoever between the Bidder and the company.

6.6.7.1 Signature on Receipts for Amounts:

Every receipts for moneys which may become payable or for any security which may become transferable to the Bidder, under these presents, shall notwithstanding anything to the contrary contained in the partnership deed, if signed in the partners in name by any one of the partners of a Bidders firm be a good and sufficient discharge to the company in respect of the money or security purported to be acknowledged, thereby and in the event of death of any of the Bidder partners during the tendency of contract, it is hereby expressly agreed that every receipt by any one of the surviving Bidder partners shall if so signed as aforesaid to be a good and sufficient discharge as aforesaid provided that nothing in this clause contained shall be deemed to prejudice shall be deemed to prejudices or affect any claim which the company may hereafter have against the legal representatives of the Bidders partner so dying or in respect of any breach of any of the conditions of the contract, provided also that nothing in this clause contained shall be deemed to prejudice or affect the respective rights or obligations of the Bidder partners and of the representatives of any deceased Bidder partner.

6.7.2 LABOUR:

6.7.2.1 WAGES TO LABOUR:

The Bidder shall comply with the provisions of the minimum wages act, (herein after referred to as the "said act") and the rules made thereunder in respect of any employees employed by him on road constructions or in building operations or in stone breaking or stone crushing or any other work being executed for the company by the Bidder for the purpose of carrying out this contract.

If, in compliance with terms of the contract, the Bidder supplies any labour to be used wholly or partly under the direct orders and control of the company whether in connection with any work being executed by the Bidder or otherwise for the purpose of the company such labour shall for the purpose of this clause, still be deemed to be persons employed by the Bidder.

If any moneys shall, as a result of any claim or applications made under the said act be directed to be paid by the company, such moneys shall be payable to the company by the Bidder. On failure by the Bidder to repay the company aforesaid amount within seven days after a notice writing by the Engineer, the company shall be entitled to recover the same from any moneys due to accruing under this or any contract with the company.

6.7.3 INSURANCE:

The Bidder shall, at his own expense, carry and maintain insurance to the satisfaction of the company as follows:

If and when the Employees State Insurance Act is made applicable to the site of works, the Bidder agrees to and does hereby accept the full and exclusive liability for the compliance with all obligations imposed by the Employees State Insurance Act as modified from time to time and the Bidder further agrees to ensure the compliance of all sub-Bidders with the applications of the said Act. The Bidder further agrees to defend, indemnify and hold harmless the company from any liability or penalty which may be passed by any State or

Local Authority by reason of any asserted violations by the Bidder or sub-Bidders of the Employees State Insurance Act and also from all claims, suits or proceedings that may be brought against the company arising under, occurring out of/or be Central or State Government authorities, or any political sub divisions thereof. The company shall retain such sums as may be necessary from the total contract value until the Bidder shall furnish satisfactory proof that all payments as required by the Employees State Insurance Act have been paid.

6.7.4 PROVISION OF PAYMENT OF WAGES ACT:

The Bidder shall comply with the provisions of the payment of wages Act and the rules made thereunder in respect of all employees employed by him on the works. If in compliance with the terms of the contract the Bidder supplies any labour to be used whole or partly under the direct orders and control of the Engineer whether in connection with the works to be executed hereunder or otherwise for the purpose of company such labour shall nevertheless be deemed to comprise persons employed by the Bidder and any moneys which may be ordered to be paid by the company shall be payable to the company by the Bidder. On failure of the Bidder to repay such moneys to the company within 7 days after a notice in writing by the Engineer, the company shall be entitled to deduct from any money due to the Bidder (whether under this contract or any other contract). The decision of the Engineer upon any question arising out of the effect or force of this clause shall be final and binding upon the Bidder.

6.7.5 REPORTING OF ACCIDENTS TO LABOUR:

The Bidder shall be responsible for the safety of all employees employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer or them Engineer's representative and shall make every arrangement to render all possible assistance.

6.7.6 WORKMEN'S COMPENSATION:

6.7.6.1 PROVISION OF WORKMEN'S COMPENSATION ACT:

i) Insurance shall be effected for all the Bidder's Employees engaged in the performance of this contract. If any of the work is sublet, the Bidder shall require the sub-Bidder to provide workmen's compensation and Employee Liability Insurance for the latter's employees unless such employees are covered under the Bidder's insurance, or by reason of the work provided for by this contract whether brought by employees of the Bidder by third parties.

ii) In every case in which by virtue of the provisions of the workmen's compensation Act, company is obliged to pay compensation to a workman employed by the Bidder in executing work the company will recover from the Bidder the amount or the compensation so paid, and without prejudice to the right of company under the said Act, company shall be at liberty to deduct it from the security deposit or from any sums payable to the Bidder, whether under this contract or otherwise company shall not be bound to contest any claim made against it under the said act except on the written request of the Bidder and upon his giving to company full security for all costs for which company might become liable in consequence of contesting such claim.

6.7.6.2 PROVISIONS OF MINES ACT:

The Bidder shall observe and perform all the provisions of the mines Act or any statutory modifications or re-enactment thereof for the time being in force and any rules and regulations made thereunder in respect of all the persons employed by him under this contract and shall indemnify the company from

and against any claims under the mines act or the rules and regulations framed thereunder by or on behalf of any persons employed by him or otherwise.

6.7.7. LABOUR CAMP:

The Bidder shall at his own expense make adequate arrangements for the housing, supply of drinking water and provision of latrines and urinals for his staff and workmen, and for temporary crèche(Balmandar) where 50 or more women are employed at a time. Suitable sites at company's land, if available may be allotted to the Bidder for the erection of labour camps, either free of charge or on such terms and conditions that may be prescribed by the company. All camp-sites shall be maintained in clean and sanitary conditions by the Bidder at his cost. The Bidder shall have no authority to establish or to issue a concessions or permits of any kind to the third parties establishing commercial amusement or other for establishment upon land owned or controlled by the Company.

6.7.7. 1 COMPLIANCE TO RULES FOR EMPLOYMENT OF LABOUR:

The Bidder shall conform to all laws, bye laws, rules and regulations for the time being in force pertaining to the employment of local or imported labour and shall take all necessary precaution to ensure and preserve the health and safety of all staff employed on the works.

6.7.7.2 PRESERVATION OF PEACE:

The Bidder shall take requisite precautions and use his best endeavors to prevent any riotous or unlawful behavior by or amongst his workmen and others employed on the works and for the preservation of peace and protection of the inhabitants and security of the property in the neighborhood of the work. In the event of the Company requiring the maintenance of a special police force at or in the vicinity of the site during the tenure of work, the expenses thereof shall be borne by the Bidder and if paid by the company shall be recoverable from the Bidder.

6.7.7.3 SANITARY ARRANGEMENTS:

The Bidder shall obey all sanitary rules and carry out all sanitary measures that may from time to time prescribed by the company and permit inspection of all sanitary arrangements at all times by the Engineer, the Engineer's representatives or the medical staff of the Company, should the Bidder fail to make adequate sanitary arrangements these will be provided by the company and the cost thereof recovered from the Bidder.

6.7.7.4 OUTBREAK OF INFECTIOUS DISEASE:

The Bidder shall remove from his camp such labour and their families who are infected as refugee. Protective inoculation and vaccination shall be arranged by the Bidder at his own cost when called upon to do so by the Engineer or Engineer's Representative. Should Cholera, Plague or any other infectious disease break out the Bidder shall burn the huts, beddings, clothes and other belongings of or used by the infected parties and promptly erect new huts on healthy sites as required by the Engineer, failing which within the time specified in the Engineer's requisition, the work may be done by the company and the cost thereof recovered from the Bidder.

6.7.7.5 MEDICAL FACILITIES AT SITE:

The Bidder shall provide medical facilities at the site as may be prescribed by the Engineer on the advice of the prescribed Medical Authority of the company or any other authority in relation to the strength of the Bidder's resident staff and workmen.

6.7.7.6 USE OF INTOXICANTS:

The sale of ardent spirits or other intoxicating beverages upon the work in any of the buildings encampments or tenements owned, occupied by or within the control of the Bidder or any of his employee is forbidden and the Bidder shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

6. 7.7.7 NON – EMPLOYMENT OF LABOURERS BELOW THE AGE OF 14:

The Bidder shall not employ children below the age of 14 as laborer's for the execution of work.

6.7.7.8 RETURN OF LABOUR ETC.:

The Bidder shall if required by the Engineer deliver to the Engineer's Representative or at is office a return in detail in such form and such intervals as the Engineer may prescribe, showing the number of the several classes of Labour from time to time employed by the Bidder at the site.

6.8.0 DETERMINATION of CONTRACT:

6.8.1 RIGHT OF COMPANY TO DETERMINE THE CONTRACT:

The company shall be entitled to determine and terminate the contract at any time should in the company's opinion, the cessation of work become necessary owing to paucity of funds or form any other cause whatsoever, in which case the value of approved materials at site and of work done to date by the Bidder will be paid for in full at the rates specified in the contract. Notice in writing from the company of such determination and the reasons there for shall be conclusive evidence thereof and binding upon the Bidder.

6.8.2 PAYMENT ON DETERMINATION CONTRACT BY COMPANY:

Should the contract be determined under clause 8.1 and the Bidder claims payment for expenditure incurred by him in the expectation of completing the whole works, the company shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer. The Bidder shall, however, have no claim to any payment whatsoever on account of profit and advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the determination of the contract. The company's decision on the necessity and propriety of such expenditure shall be final and conclusive.

6.8.3 DETERMINATION OF CONTRACT OWING TO DEFAULT OF CONTRACT:

If the Bidder should –

6.8.3.1.1 Become bankrupt or insolvent

6.8.3.1.2 Make an arrangement, with or assignment in favour of his creditors, or agree to carry out the contract under a committee of Inspection of his creditors.

Or

6.8.3.1.3 Being a company or corporation, go into liquidation (Other than a voluntary liquidation for the purpose of amalgamation or reconstruction).

Or

6.8.3.1.4 Have an execution levied on his goods or property on the works.

Or

6.8.3.1.5 Assign the contract or any part thereof otherwise than as [provided in condition 6.2.6 of these conditions.

Or

6.8.3.1.6 Abandon the contract

Or

6.8.3.1.7 Persistently disregard the instructions of the Engineer, or contravene any provisions of the contract.

Or

6.8.3.1.8 Fail to adhere to the program of work by a margin of 10% of the stipulated period.

Or

6.8.3.1.9 Fail to remove materials from the site or to pull down and replace work after receiving from the Engineer's notice to the effect that the said materials or work have been condemned or rejected under condition of contract.

Or

6.8.3.1.10 Fail to take steps to employ competent or additional staff and Labor as required under condition of contract

Or

6.8.3.1.11. Fail to afford Engineer or Engineer's Representative proper facilities for inspecting the works or any part thereof.

Or

6.8.3.1.12 Promise offer or give any bribe, Commission, Gift or advantage either himself or through his partner, agent or servant to any officer or employee of the company, or to any person on his or in their behalf in relation to the execution of this or any other contract with company.

Then and in any of the aforesaid cases, the Engineer on behalf of the company may serve the Bidder with a notice in writing to that effect and if the Bidder does not within 7 days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid to the entire satisfaction of the Engineer, the company shall be entitled after giving 42-hour notice in writing under the hand of the accepting authority to rescind the contract as a whole or in a part or parts(as may be specified in such notice) and adopt either or both of the following courses.

a) To carryout whole or part of the work from which the Bidder has been removed by the employment of the required labour and materials, the costs of which shall include lead, lift, freight, supervision and all such incidental charges.
b) To Measure up the whole or part of the work from which the Bidder has been removed and to get it completed by another Bidder.

The manner and method in which such work is completed shall be in the entire discretion of the accepting authority whose decision shall be final and in both cases (a) and (b) mentioned above and company shall be entitled to:

i) To forfeit the whole or such portion of the security deposit as it may consider fit.

AND

ii) To recover from the Bidder the cost of carrying out the work in excess of the sum which would have been payable according to the certificates of the Engineer to the Bidders, if the works had been carried out by the Bidder under the terms of the contract, such certificate being final and binding upon the Bidder, provided however, such recovery shall be made only when the cost incurred in excess is more than the security deposit proposed to be forfeited and shall be limited to the amount by which the cost incurred in excess is more than the security deposit proposed to be forfeited and shall be limited to the amount by which the cost incurred in excess, exceeds the security deposits proposed to be forfeited. The amount thus to be forfeited or recovered may be deducted from any moneys then due or which at any time thereafter may become due to the Bidder by the Company under this or any other Bidder or otherwise.

Provided always that in any case, in which any of the powers conferred upon the company by sub-clause as above shall have become exercisable and the same shall not be exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions thereof, such powers shall notwithstanding to exercisable in the event of any future case of default by the Bidder for which his liability for past and future shall remain unaffected.

6.8.3.2 RIGHT OF COMPANY AFTER RESCISSION OF CONTRACT OWING TO DEFAULT OF BIDDER.

In the event of any of several of the courses, referred to in conditions 6.8.3 of this clause, being adopted:

6.8.3.2.1 The Bidder shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any commitments or made any advance on account or with a view to the execution of the works of the performance of the contract and Bidder shall not be entitled to recover or be paid any sum for any work thereto or actually performed under the contract unless until the Engineer shall have certified the performance of such work and the value payable in respect where of and the Bidder shall only be entitled to be paid the value so certified.

6.8.3.2.2 The Engineer or the Engineer's representative shall be entitled to take possession of any materials, tools, implements, machinery and buildings on the works or on the property on which these are being or ought to have been executed, and to retain and employ the same in the further execution of the works or and part thereof until the completion of the works without the Bidder being entitled to any compensation for the use and employment there of or for wear and tear or destruction thereof.

6.8.3.2.3 The Engineer, shall as soon as may be practicable after removal of the Bidder fix and determine ex-party or by or after reference to the parties or after such investigation or inquiries as he may consider fit to make or institute and shall consider fit to make or had at the time or rescission of the contract been reasonably earned by or would reasonably accrue to the Bidder in respect of the work then actually done by him under the contract and what was the value of any unused, or partially used materials, any construction plant and temporary works upon the site.

6.8.3.2.4 The Company shall not be liable to pay to the Bidder any money on account of the contract until the expiration of the period of maintenance and thereafter until the cost of completion and maintenance damages (if any), and all other expenses incurred by the Company have been ascertained and the amount thereof certified by the Engineer. The Bidder shall then be entitled to receive only such sum or sums (if any) as the Engineer may certify would have been due to him upon due completion by him after deducting the said amount, but if such amount exceeds the sum which would have been payable to the Bidder, shall upon demand, pay to the Company the amount of such excess and it shall be deemed a debit by the Bidder to the Company and shall be recoverable accordingly.

6.8.3.3 TERMINATION OF CONTRACT FOR DEATH:

If the Bidder is an individual or a proprietary concern and the individual or the proprietor dies and if the Bidder is a partnership concern and one of the partner dies then unless the company is satisfied that the legal representative of the individual Bidder or of the proprietor of the proprietary concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the contract, the company shall be entitled to cancel the contract as to its incomplete part without the company being in any way liable to payment of any compensation to the estate of the deceased Bidder and/or to the surviving partners of the Bidders firm on account of the cancellation of the contract. The decision of the company that the legal representative of the deceased Bidder or the surviving partners of the Bidder's firm cannot carry out and complete the contract shall be final and binding on the parties.

In the event of such cancellation the company shall not hold the estate of the deceased Bidder and/or the surviving partners of the Bidder's firm liable for damages for not completing the contract.

6.9.0 SETTLEMENT OF DISPUTES:

6.9.1 MATTERS FINALLY DETERMINED BY THE COMPANY

All disputes or difference of any kind whatever arising out of or in connection with the contract, whether during the progress of the works or after completion and whether before or after the determination of the contract, shall be referred by the Bidder to the Company and the Company shall within a reasonable time after their representation make and notify decision thereon in writing. The decisions, direction and certificates with respect to any conditions given and made by the Company or by the Engineer on behalf of the Company which matters are referred to herein after as accepted matters shall be final and binding upon the Bidder and shall not be set aside or be attempted to be set aside on account of any informality, omission, delay of error in proceeding in about the same or any other ground or for other reason and shall be without appeal.

6.9.2 DEMAND FOR ARBITRATION:

6.9.2.1 If the Bidder be dissatisfied with the decision of the Company, on any matters in question, dispute or difference on any account or as to the withholding by the Company of any certificates to which the Bidder may claim to be entitled to or if the Company fails to make a decisions within a reasonable time, when and in any such cases but except in any of the expected matters with in ten days of the receipt of communication or such decisions or after the expiry of reasonable time (which reasonable time will in no case exceed three months) as the case may be shall demand in writing that such matters in question, dispute or difference be referred to Arbitration. Such demand for Arbitration shall be delivered to the Company by the Bidder and shall specify the matters which are in question, dispute or difference and such disputes or difference of which the demand has been made and no other matter shall be referred to arbitration.

6.9.2.2 OBLIGATION DURING PENDENCY OF ARBITRATION:

Work during the contract shall unless otherwise directed by the Engineer, continue during proceedings and no payment due or payable by the Company shall be withheld on account of such proceedings provided, however, it shall be open for the arbitrator to decide whether such work should continue or not during arbitration proceedings.

6.9.2.3 ARBITRATION:

Except where otherwise provided for in the contract, all questions and dispute relating to the meaning of the specifications, designs, drawings, estimates, instructions and conditions herein mentioned and as to the quality of workmanship, or materials used on the work or as any way arising out of or relating to the contract, designs, drawings, specifications, estimates, Instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of work or after the completion or abandonment thereof shall be referred to the sole arbitration of accepting authority and if the accepting authority is unable or unwilling to act, to the sole arbitration of some other person appointed by the accepting authority. There will be no objection if the arbitrator so appointed is an employee of the ITI LIMITED and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he has expressed views on all or any of the matters in disputes of difference.

The Arbitrator to whom the matter is originally referred being transferred or vacating his office being unable to act for any reason, the accepting authority as aforesaid at the time of such transfer, vacation of office or inability

to act shall appoint another person to act as Arbitrator in accordance with the terms of the contract. Such person shall be entitled to proceed with the reference from stage at which it was left by his predecessor. It is also a term of this contract that no person other than a person appointed by accepting authority, as aforesaid, should act as arbitrator and if for any reason, that is not possible, the matter is not to be referred to Arbitration at all. In all cases where the amount of the claim on dispute is Rs. 50,000/- (Rupees fifty thousand) and above, the arbitrator shall give reason for the award. It is also terms of this contract that the venue of the arbitration shall be Corporate Office of ITI Limited, Dooravaninagar, Bengaluru, 560016.

It is term of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

It is also a term of the contract that if the Bidder(s) does/do not make any demand for Arbitration in respect of any claim(s) in writing within ninety days [90] of receiving the intimation from the Company, that the bill is ready for payment the claim of the Bidders will be deemed to have been waived and absolutely be barred and the Company shall be discharged of all liabilities under the contract in respect of these claims.

The arbitrator(s) may from time to time with the consent of the parties enlarge the time for making and publishing the award.

Subject as aforesaid the provisions of the Arbitration and Conciliation Act 1996 and subsequent latest amendment or any statutory modification or re-enactment thereof & the rules made there under & for the time being in force shall apply to the arbitration proceedings under this clause.

The decision of the Arbitrator shall be final and binding on the parties to this Contract.

Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the Arbitrator shall be shared equally by the Bidder and the Company.

6.9.2.4 Jurisdiction of Courts: For any legal matters arising out of this contract, the designated courts in Bangalore only shall have jurisdictions.

6.9.3 On demand from the company or statutory authorities like the labour/PF/ESI/Commissioner during the course of execution or after, the Bidder has to arrange the required documents, certificates and fulfill all statutory obligations. Signature of the Bidder

6.10 SPECIFICATIONS AND SPECIAL CONDITIONS

6.10.0 Specifications:

6.10.1 The work shall be executed in strict accordance with the accepted conditions of contract, bill of quantities, specifications and orders as may be issued by the Engineer-in-Charge and his representatives.

6.10.2 If Specifications for any item of work are not covered by any of the documents mentioned in NIT, the same shall be decided and conveyed by the Engineer-in-charge to the Bidder.

6.10.3In case of conflict amongst the provisions of bill of quantities, specifications and drawings the following precedence shall be followed.

a) Descriptions of item in the bill of quantities.

b) Provisions in the specifications.

c) Provision in the drawings.

6.10.4 In the case of conflict amongst the various drawings, the decisions of Engineer - in–charge shall be final and binding.

6.10.5 Samples of all the materials and workmanship proposed to be employed in the execution of works, shall be got approved from the Engineer –in-Charge in writing. The Engineer or his representative will reject all materials or workmanship not corresponding in quality or character with the approved samples. All expenses in this connection shall be borne by the Bidder.

6.10.6 Tests: If so required by the Engineer, the Bidder shall provide all facilities at site or at manufacturers work or in an approved laboratory for testing of materials/and/or workmanship. All the expenditure in respect of this shall be borne by the Bidder unless specified otherwise in the contract.

6.10.7 The Bidder shall, when required to do so by the Engineer, submit at his own cost, manufacturer's certificate of tests. Proof sheets, Mill sheets etc., showing that the materials have been tested in accordance with the requirements of this specification.

6.11.0 <u>Special conditions</u>

1. These special conditions shall be read in conjunction with general of the contract. Where the provisions of these conditions are at variance with the provisions of the general conditions of the contract, the provisions of these special conditions shall take precedence.
2. The Bill of quantities is to be read in conjunction with the form of Tender, Drawings, Conditions of Contract, specifications as these documents are jointly explanatory and descriptive of the works included in contract.
3. The rates quoted in the bill of Quantities are to be for full inclusive value of the work described under the several items, including all costs and expense which may be required in and for the construction and full protection of the work described, together with all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based. The quoted rates will be for all heights, lifts and leads unless otherwise mentioned specifically in the description of them.
4. The quantities of work in the schedule are not to be considered as limiting for the amount of work to be done by the Bidder. The quantities are an estimate of the amount of work to be executed and the work will be measured on completion and the Contract amount adjusted accordingly.
5. General directions and descriptions of work and materials given elsewhere in the contract documents are not necessarily repeated in the Schedule. Reference is to be made to the other documents for full information.
6. The Bidder will be held to have visited the site before preparing the tender and to have examined for himself the conditions under which the work will be carried out, including local conditions affecting labour and to have studied the items of the bill of quantities, the Drawings and specifications, clauses relating to them and to have satisfied himself that the rates quoted by him provide for all minor accessories and contingent works or services necessary for the works described even though they are not precisely defined.
7. All measurements, A/T, Bills etc. are required to be verified by TPA/ representative of BBNL asper the condition in RFP of BBNL.
8. Bidder is responsible for obtaining the permission of ROW and pay the charges for the same however the re-imbursement of ROW charges on actual basis will be made by company on production of receipt of deposit and permission letter/ agreement
9. Bidder is to upload all work progress on Web/Mobile Portal/ PMT & GIS on daily basis.
10. As per RFP, GPS recording of OFC route at an interval of 10 mtrs will be uploaded on regular basis.
11. Company will provide training on Installation and Commissioning of G-PON equipment on site.

12. The work shall be deemed completed after completion of A/T of all GPs.
13. All Acceptance Testings and verification of measurement will be carried out by TPA.
14. All types of OF Cable and HDPE pipe and G-PON equipments (OLT, ONT and accessories) will be provided by ITI.
15. Transportation charge will be borne by bidder.
16. The quantity indicated in BOQ are tentative and may vary as per actual requirement.
17. The following items shall be provided by ITI
    a. 24F Metal Free optical fibre Cable with double HDPE Sheath (G.652D Fibre) loose tube type.
    b. HDPE PLB Duct with Coupler and End-Cap
    c. OLT
    d. ONT
    e. FDMS with racks
    f. Splitter
    g. Patch Cord
    h. Joint Box for OFC
    i. FTB
18. Materials listed above will be provided by ITI Ltd. and rest of the materials required for the execution of the work will be responsibility of bidder.
19. All materials used in the project shall comply to the specifications of BBNL Tender/its Addendums.

Annexure-I (A)

DETAILS OF GRAM PANCHAYATS

Details of Andaman & Nicobar GPs:

State	Name of District	Name of Block	Name of GPs	Latitude	Longitude
A & N	Nicobar	Campbellbay	Laxminagar	7.01351	93.9289
A & N	Nicobar	Campbellbay	Campbellbay	7.01441	93.93017
A & N	Nicobar	Campbellbay	Govindnagar	7.01148	93.93275
		TOTAL Campbellbay	**3**		
	TOTAL Nicobar	**1**	**3**		
A & N	North & Middle Andaman	Diglipur	Diglipur	13.24078	92.97168
A & N	North & Middle Andaman	Diglipur	Subhashgram	13.24533	92.97292
A & N	North & Middle Andaman	Diglipur	Madhupur	13.2627	92.9718
A & N	North & Middle Andaman	Diglipur	Laxmipur	13.28574	92.96206
A & N	North & Middle Andaman	Diglipur	Radhanagar	13.36953	92.93006
A & N	North & Middle Andaman	Diglipur	Ramakrishnagram	13.24903	92.97876
A & N	North & Middle Andaman	Diglipur	Keralapuram	13.2573	93.01263

A & N	North & Middle Andaman	Diglipur	Gandhinagar	13.27857	93.02502
A & N	North & Middle Andaman	Diglipur	Shibpur	13.23965	93.03965
A & N	North & Middle Andaman	Diglipur	Sitanagar	13.23078	92.94469
A & N	North & Middle Andaman	Diglipur	Kalighat	13.1243	92.9481
A & N	North & Middle Andaman	Diglipur	Nabagram	13.16035	92.94672
A & N	North & Middle Andaman	Diglipur	Ramnagar	13.0871	93.00766
A & N	North & Middle Andaman	Diglipur	Kishorinagar	13.1911	92.8767
A & N	North & Middle Andaman	Diglipur	Paschimsagar	13.26556	92.88164
		TOTAL Diglipur	**15**		
A & N	North & Middle Andaman	Mayabunder	Mayabundar	12.91478	92.8978
A & N	North & Middle Andaman	Mayabunder	Pokadera	12.89885	92.89948
A & N	North & Middle Andaman	Mayabunder	Rampur	12.88087	92.88552
A & N	North & Middle Andaman	Mayabunder	Pahalgaon	12.83597	92.84825
A & N	North & Middle Andaman	Mayabunder	Chainpur	12.7638	92.80389
A & N	North & Middle Andaman	Mayabunder	Basintipur	12.71922	92.88433
A & N	North & Middle Andaman	Mayabunder	Harinagar	12.67559	92.88277
A & N	North & Middle Andaman	Mayabunder	Swadesnagar	12.65286	92.89103
		TOTAL Mayabunder	**8**		
A & N	North & Middle Andaman	Rangat	Parnashala	12.51736	92.91097
A & N	North & Middle Andaman	Rangat	Dashrathpur	12.50658	92.93601
A & N	North & Middle Andaman	Rangat	Nimbutala	12.50254	92.95247
A & N	North & Middle Andaman	Rangat	Shivapuram	12.61447	92.93839
A & N	North & Middle Andaman	Rangat	Sabari	12.48308	92.90127
A & N	North & Middle Andaman	Rangat	Bakultala	12.51257	92.86436
A & N	North & Middle Andaman	Rangat	Urmilapur	12.52912	92.82789
A & N	North & Middle Andaman	Rangat	Kaushalyanagar	12.34649	92.77298
A & N	North & Middle Andaman	Rangat	Uttara	12.17922	92.78843

A & N	North & Middle Andaman	Rangat	Kadamtala	12.32819	92.79133
A & N	North & Middle Andaman	Rangat	Nilambur	12.50563	92.8574
A & N	North & Middle Andaman	Rangat	Sundergarh	12.168	92.7699
A & N	North & Middle Andaman	Rangat	Long Island	12.21544	92.55265
		TOTAL Rangat	**13**		
	TOTAL North & Middle Andaman	**3**	**36**		
A & N	South Andaman	Ferrargunj	Chouldari GP	11.63072	92.66706
A & N	South Andaman	Ferrargunj	Humphrygunj	11.5981	92.62494
A & N	South Andaman	Ferrargunj	Guptapara	11.57512	92.65878
A & N	South Andaman	Ferrargunj	Ferrargunj GP	11.71729	92.65411
A & N	South Andaman	Ferrargunj	Tushnabad	11.67271	92.6437
A & N	South Andaman	Ferrargunj	Brindaban	11.72198	92.66766
A & N	South Andaman	Ferrargunj	Namunaghar	11.67311	92.68098
A & N	South Andaman	Ferrargunj	Mithakhari	11.72052	92.65438
A & N	South Andaman	Ferrargunj	Kanyapuram		
A & N	South Andaman	Ferrargunj	Collinpur		
A & N	South Andaman	Ferrargunj	Wandoor		
A & N	South Andaman	Ferrargunj	Wimberlygunj GP	11.74084	92.70685
A & N	South Andaman	Ferrargunj	Manarghat	11.722	92.66908
A & N	South Andaman	Ferrargunj	Shoalbay	11.85089	92.7328
A & N	South Andaman	Ferrargunj	Stewartgunj	11.72424	92.70988
A & N	South Andaman	Ferrargunj	Bambooflat-I	11.70953	92.71764
A & N	South Andaman	Ferrargunj	Bomboflat-II		
A & N	South Andaman	Ferrargunj	Shorepoint	11.73745	92.70842
A & N	South Andaman	Ferrargunj	Hope Town	11.7044	92.71467
		TOTAL Ferrargunj	**19**		
A & N	South Andaman	Hutbay	Vivekanandapur	10.7428	92.56185
A & N	South Andaman	Hutbay	Rabindra Nagar		
A & N	South Andaman	Hutbay	Ramakrishnapur	10.69522	92.56929
A & N	South Andaman	Hutbay	Netaji Nagar	10.5935	92.53856
A & N	South Andaman	Hutbay	Hutbay	10.59096	92.53934
		TOTAL Hutbay	**5**		
A & N	South Andaman	Prothrapur	Sippighat	11.60135	92.68346
A & N	South Andaman	Prothrapur	Beodnabad	11.56018	92.72928
A & N	South Andaman	Prothrapur	Callicut		
		TOTAL Prothrapur	**3**		
	TOTAL South Andaman	**3**	**27**		
GRAND TOTAL	**3**	**7**	**66**		

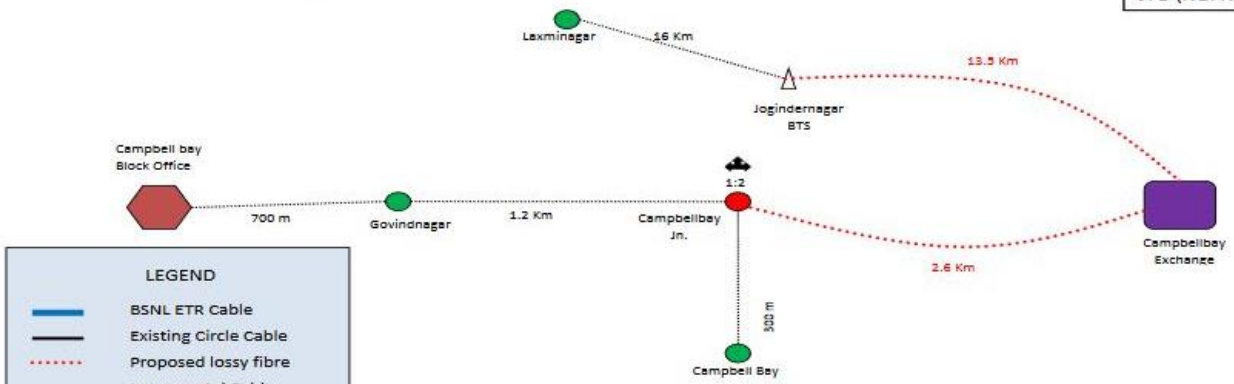
Note: Above list is total scope of work of the project. Allotted Name of the GP's and Route details will be shared at the time of award of contract.

Proposed Layout of OF Cable Diagrams

1. Campbell Bay Block – L14 Diagram

CAMPBELL BAY BLOCK

Prepared by:
ABHAY KUMAR PANDEY
JTO (NOFN), BSNL



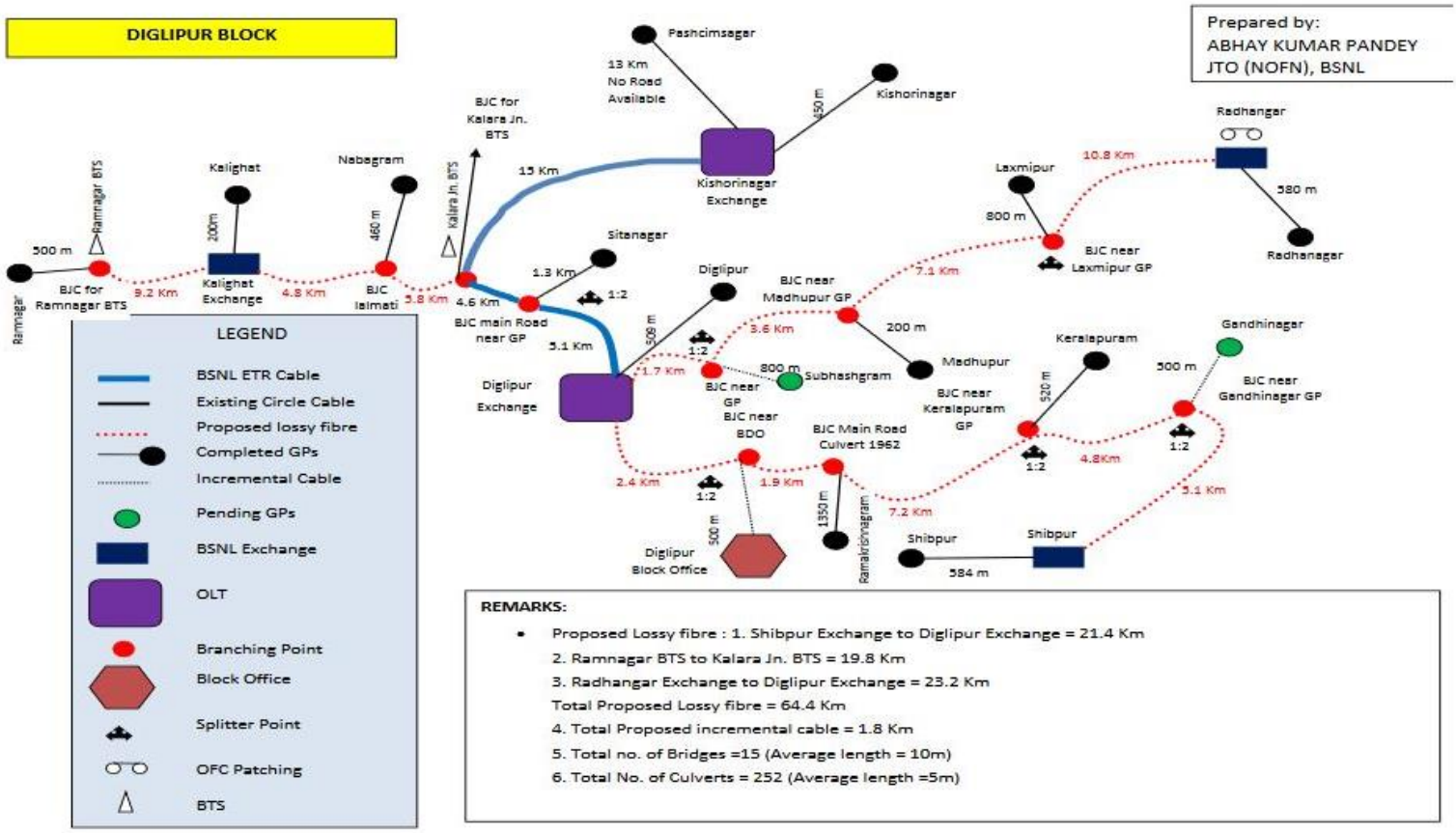
LEGEND

- BSNL ETR Cable
- Existing Circle Cable
- Proposed lossy fibre
- Incremental Cable
- Pending GPs
- BSNL Exchange
- OLT
- Branching Point
- Block Office
- Splitter Point
- OFC Patching
- BTS

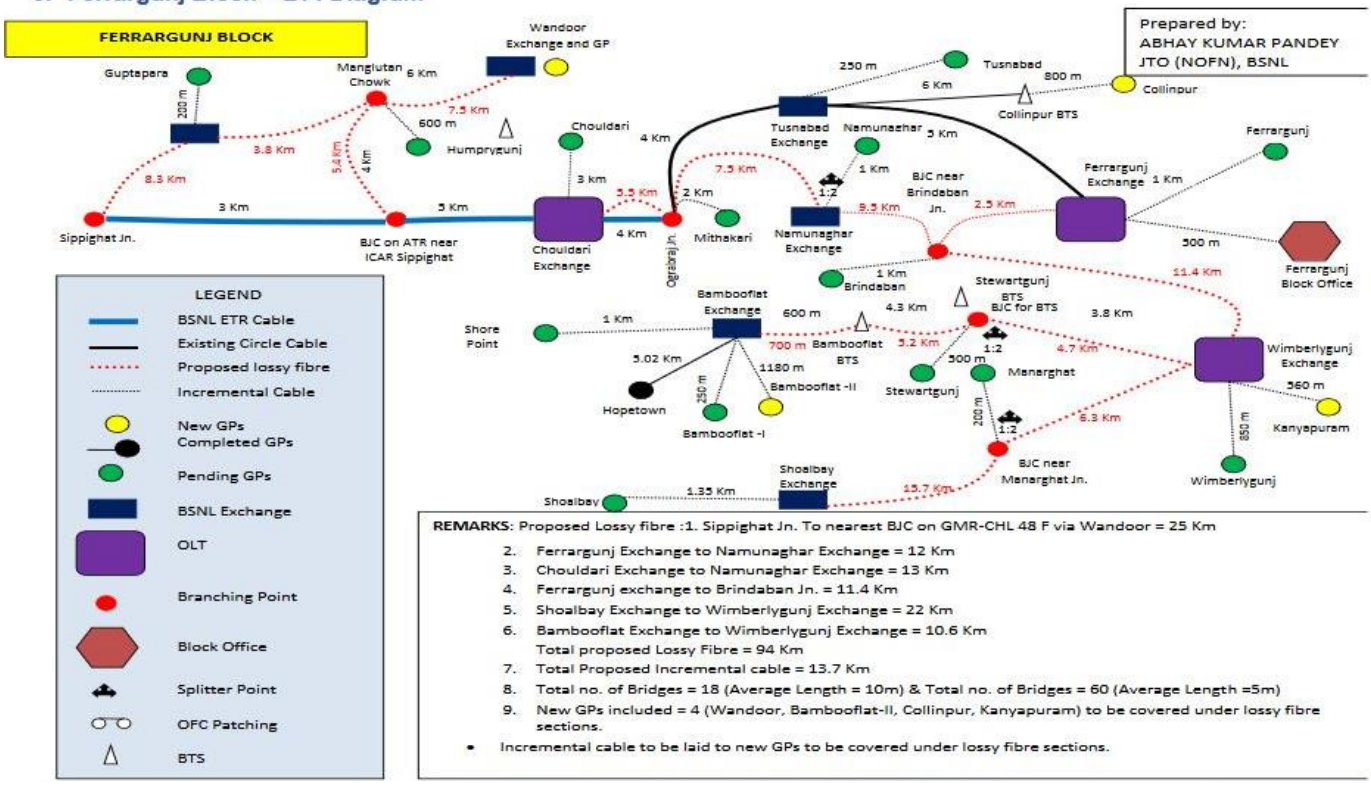
REMARKS:

- Proposed Lossy fibre :
  1. Campbell Bay Exchange to Campbell Bay Jn. = 2.6 Km
  2. Campbell Bay Exchange to Joginderngar BTS = 13.5 Km
     Total Proposed Lossy Fibre = 16.1 Km
  3. Total Proposed Incremental cable = 18.2 Km
  4. Total No. of Bridges = 15 (Average Length = 10m)
  5. Total No. of Culverts = 115 (Average Length = 5m)
- Laxminagar GP shifted to 16 Km far location.

2. Diglipur Block –L14 Diagram



3. Ferrargunj Block – L14 Diagram

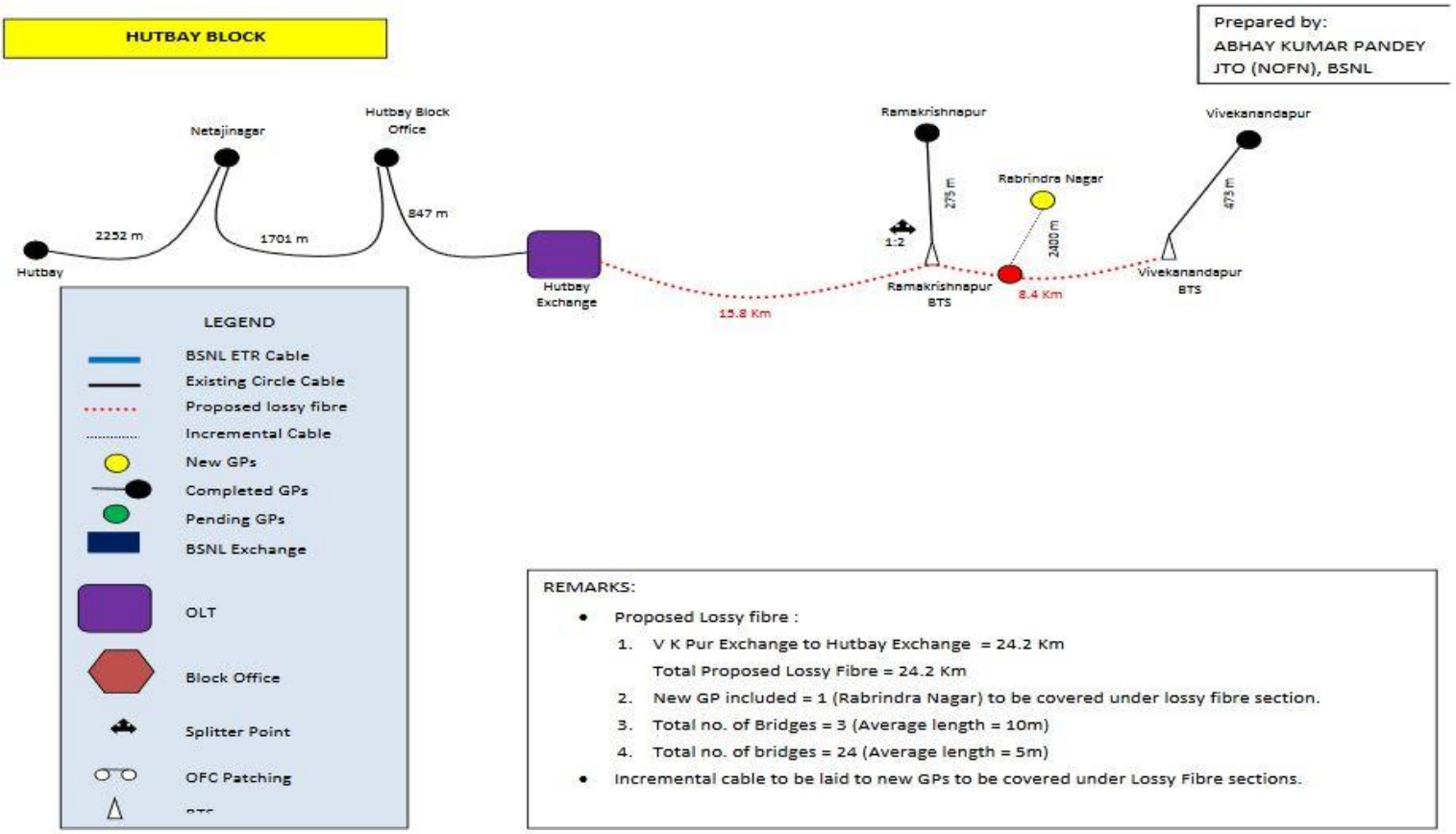


REMARKS: Proposed Lossy fibre :1. Sippighat Jn. To nearest BJC on GMR-CHL 48 F via Wandoor = 25 Km

2. Ferrargunj Exchange to Namunaghar Exchange = 12 Km
3. Chouldari Exchange to Namunaghar Exchange = 13 Km
4. Ferrargunj exchange to Brindaban Jn. = 11.4 Km
5. Shoalbay Exchange to Wimberlygunj Exchange = 22 Km
6. Bambooflat Exchange to Wimberlygunj Exchange = 10.6 Km
   Total proposed Lossy Fibre = 94 Km
7. Total Proposed Incremental cable = 13.7 Km
8. Total no. of Bridges = 18 (Average Length = 10m) & Total no. of Bridges = 60 (Average Length =5m)
9. New GPs included = 4 (Wandoor, Bambooflat-II, Collinpur, Kanyapuram) to be covered under lossy fibre sections.

- Incremental cable to be laid to new GPs to be covered under lossy fibre sections.

4. Hutbay Block – L14 Diagram



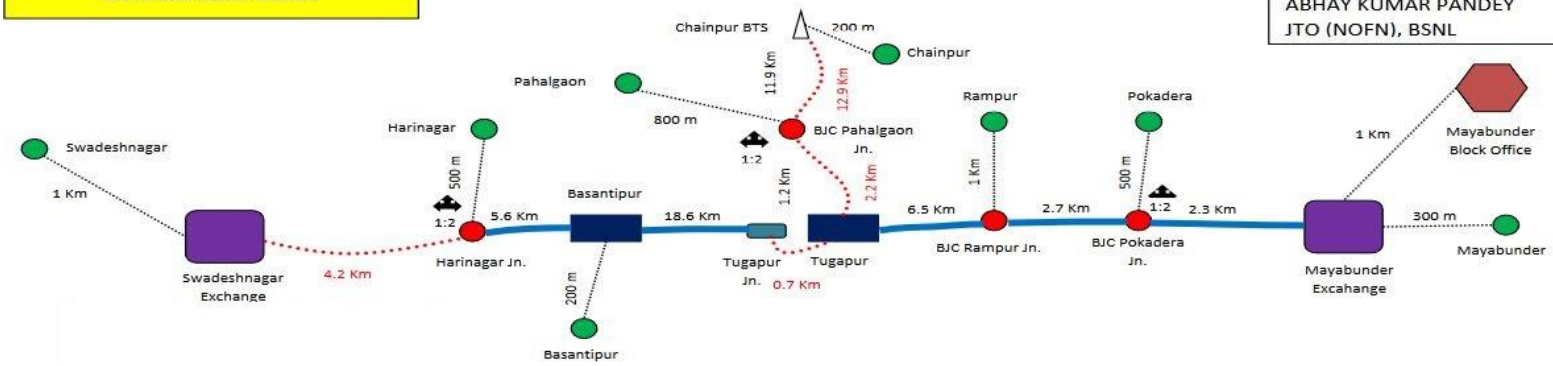
REMARKS:

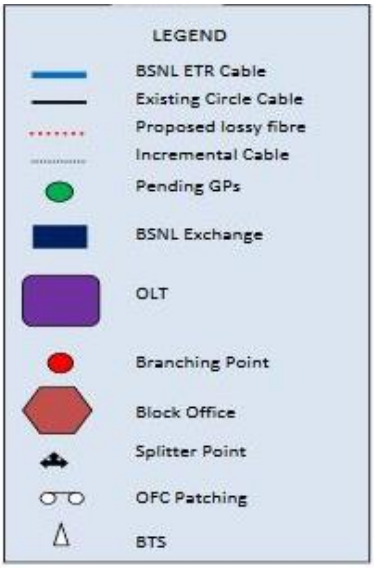
- Proposed Lossy fibre :
  1. V K Pur Exchange to Hutbay Exchange = 24.2 Km
     Total Proposed Lossy Fibre = 24.2 Km
  2. New GP included = 1 (Rabrindra Nagar) to be covered under lossy fibre section.
  3. Total no. of Bridges = 3 (Average length = 10m)
  4. Total no. of bridges = 24 (Average length = 5m)
- Incremental cable to be laid to new GPs to be covered under Lossy Fibre sections.

5. Mayabunder Block- L14 Diagram

MAYABUNDER BLOCK

Prepared by:
ABHAY KUMAR PANDEY
JTO (NOFN), BSNL

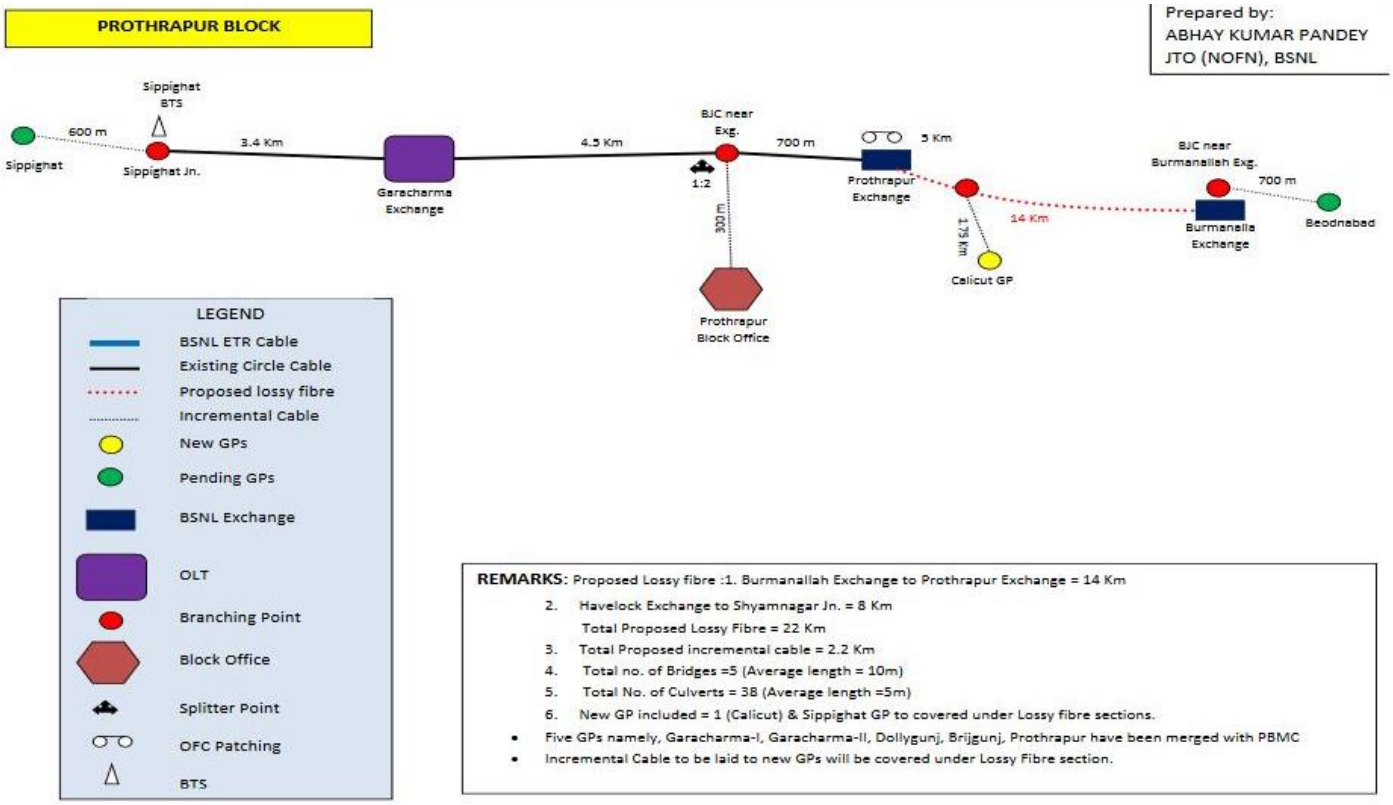




REMARKS:

- Proposed Lossy fibre :
  1. Chainpur BTS to Tugapur Jn. = 15.8 Km
  2. Harinagar Jn. To Swadeshnagar Exchange = 4.2 Km
     Total proposed Lossy Fibre = 20 Km
  3. Total Proposed Incremental Cable = 5.5 Km
  4. Total No. of Bridges = 6 (Average Length =10m)
  5. Total No. of Culverts = 58 (Average Length =5m)

6.Prothrapur Block –L14 Diagram

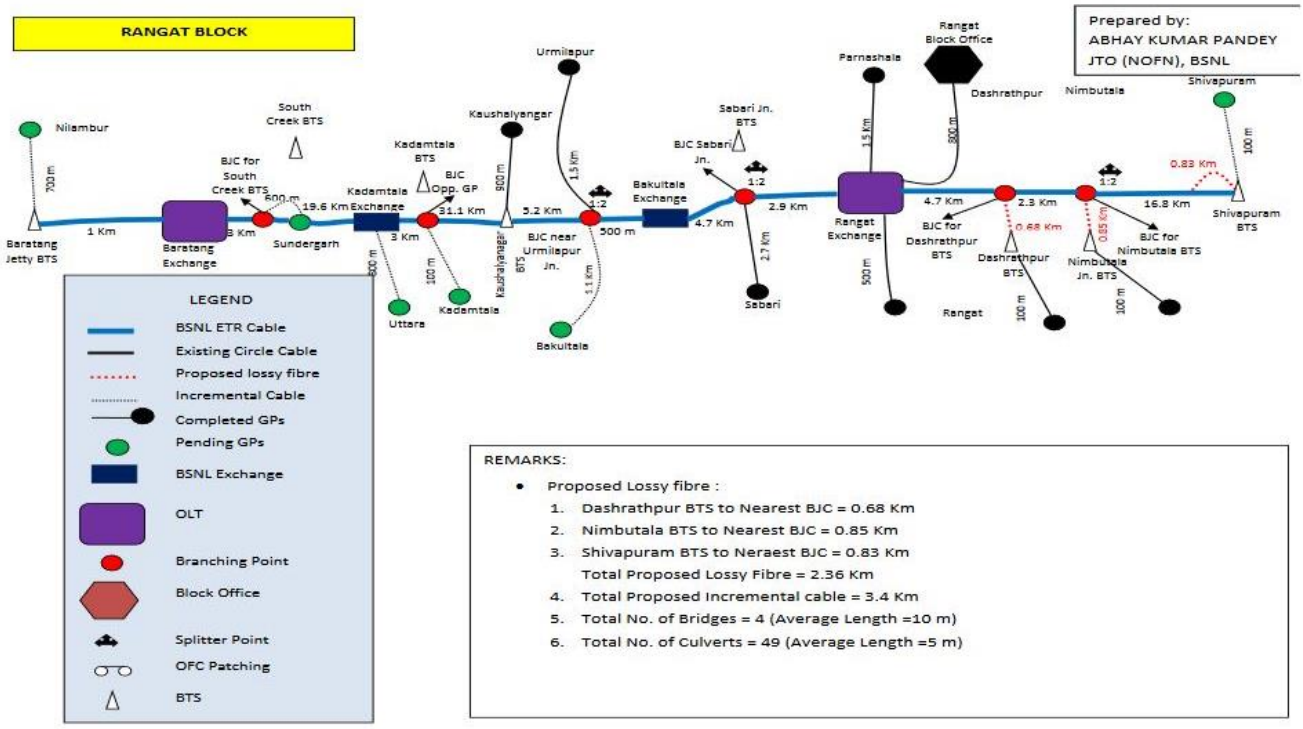


REMARKS: Proposed Lossy fibre :1. Burmanallah Exchange to Prothrapur Exchange = 14 Km

2. Havelock Exchange to Shyamnagar Jn. = 8 Km
   Total Proposed Lossy Fibre = 22 Km
3. Total Proposed incremental cable = 2.2 Km
4. Total no. of Bridges =5 (Average length = 10m)
5. Total No. of Culverts = 38 (Average length =5m)
6. New GP included = 1 (Calicut) & Sippighat GP to covered under Lossy fibre sections.

- Five GPs namely, Garacharma-I, Garacharma-II, Dollygunj, Brijgunj, Prothrapur have been merged with PBMC
- Incremental Cable to be laid to new GPs will be covered under Lossy Fibre section.

7. Rangat Block – L14 Diagram



REMARKS:

- Proposed Lossy fibre :
  1. Dashrathpur BTS to Nearest BJC = 0.68 Km
  2. Nimbutala BTS to Nearest BJC = 0.85 Km
  3. Shivapuram BTS to Neraest BJC = 0.83 Km
     Total Proposed Lossy Fibre = 2.36 Km
  4. Total Proposed Incremental cable = 3.4 Km
  5. Total No. of Bridges = 4 (Average Length =10 m)
  6. Total No. of Culverts = 49 (Average Length =5 m)

Annexure-II-A

PLAN, DESIGN, IMPLEMENT AND COMMISSIONING PHASE

The scope of work shall broadly comprise of site survey; due diligence; supply of fiber, duct, electronics, Solar Panel, including all the accessories; trenching, laying, blowing, splicing of fiber, back filling; live line installation and commissioning of optical fiber cable on the existing power distribution poles. If need arises for additional new poles to follow optimal path/route, such additional new poles shall be installed by the PIA. The fiber shall be terminated at ONT/Switch supplied through this contract at respective Gram Panchayat. The PIA shall be required to supply, install, commission and test the overall deployment at each site which include successful testing of connectivity from ONT (Gram Panchayat) to OLT (Block premises), as well as testing of each core of fiber laid from the PoP/Block to Gram Panchayat.

The broad scope of work during this phase shall include the following, but is not limited to;

- Site Survey
- Designing the network
- Project Planning for execution of project within stipulated timelines.
- Installation and Commissioning of IT and non IT components
- Installation and Commissioning of Physical Infrastructure components such as Solar Power(SPV) and network cabling etc. as per requirements
- Commissioning and Acceptance testing of the required components and making the network available to the GP level for service provisioning and/or utilization as per the framework specified by PIA All documentation generated during planning, installation and commissioning phase shall always be made available to BBNL
- Integration of EMS with BBNL NOC Successful bidder shall be responsible to integrate all OLTs for accessibility of ONTs parented with them to BBNL NOC through an Existing EMS/ new EMS point supplied and installed at one of location in Andaman & Nicobar. BBNL shall be responsible to provide necessary connectivity upto BBNL NOC
- Mapping of OF Cable Route created, including those existing details with ABD Diagrams and providing data in required format (SHAPE Or (.SHP)) for incorporation in BBNL GIS Tool.
- Operations & Maintenance of Network after commissioning

2.1.1. SITE SURVEY

The PIA shall conduct exhaustive site survey based on optimal path for preparing the Bill of Quantity (BoQ) for each site. Once the Award of Work is issued to the Bidder, for successful implementation and completion of the site, the PIA needs to finalise a site survey report and BoQ within 8 weeks of issuance of Award of Work. Based on the site survey report and finalised BoQ, the PIA shall carry out the implementation of the work order.

a) PIA shall conduct an actual GIS based survey within 8 weeks from issuance of Award of work
b) PIA shall carry out the site survey by capturing on site coordinates at every 20-30 mtrs through GIS/Mobile application and related tools.

c) Data generated by site survey shall be shared with BBNL and it shall be integrated with GIS application and with Project Management tool of BBNL.
d) Designing, planning of passive optical network, as well as creation of database for utility infrastructure. The PIA shall prepare KMZ/KML file as per the data recorded during site survey from Block to GP using optimised routes.
e) During the survey, the PIA shall take into account connectivity to GP based on optimal path for fiber layout covering maximum population en-route.
f) A final exhaustive site survey report should be submitted covering detail BoQ for each GPs and further consolidated at Block level, deviation from indicative BoQ (As per the financial bid format given in Section IV), risks involved to execute the work along with mitigation plan, resources required as well as a quality assurance plan indicating expected deviations along with the project execution strategy. A comprehensive documentation folder in soft copy (in Video format, KMZ format and MS Excel) to be submitted on the completion of the survey
g) BBNL shall validate, vet and approve the site survey report and BoQ as prepared by the PIA
h) In order to utilize the OLT at the PoP effectively, optical splitters may be required for connectivity and hence the requirement of the splitters should be assessed during the survey.

In case there is a deviation between the BoQ prepared by the PIA after exhaustive site survey and indicative BoQ given in this RFP, the following terms shall prevail:

a) If BoQ provided by the PIA is less than the indicative BoQ then BoQ provided by the PIA shall be approved through TPA by Implementation Committee of the BBNL.
b) If BoQ provided by the PIA is higher and within 10% of indicative BoQ than BoQ provided by the PIA shall be approved through TPA by Implementation Committee of the BBNL based on the reasonable justifications.
c) If BoQ provided by PIA is higher and greater than 10% of indicative BoQ then the PIA shall provide a detailed report to State Head/BBNL through TPA and Implementation Committee of the BBNL may recommend and send the report to BBNL Corporate Office for further implementation. This shall be dealt on case to case basis on providing reasonable justification.

Note: In any case site survey and BoQ provided by PIA shall be inspected and validated by TPA. Based on approved site survey firm work order shall be issued to PIA

2.1.2. FIBER **IMPLEMENTATION:**

1. Based on the approved site survey report, the PIA shall be required to initiate fiber implementation.

2. Supply, delivery to site, unloading, storing, warehousing and handling of Optical Fiber cable equipment along with fittings and associated items as required, including the HDPE PLB duct, splitters, ONT, FDMS etc. as per the approved survey report.
3. Trenching, Laying, Backfilling, Blowing, Splicing, Terminating, Installation and Commissioning of underground fiber from Block to GP as per Annexure B – Engineering Instructions. (For underground fibre).
4. Live line Installation and Commissioning of Optical Fiber Cable on the existing power distribution poles from the nearest Block PoP to Gram Panchayat using appropriate pole clamping and accessories as per Annexure B – Engineering Instructions. (For Aerial fibre).
5. End-to-End testing of the connectivity thus laid from ONT at GP till Block OLT and further to BBNL NOC.
6. Testing of each core of the fibre.
7. The PIA shall complete all the implementation of the sites in the allocated district/block within the stipulated time.
8. The PIA shall also have to integrate the Fiber optic network with BBNL Network Operations Centre in New Delhi or Bangalore in coordination with BBNL NOC team.

2.1.3. OLT, ONT AND SOLAR PANEL (SPV) INSTALLATION & COMMISSIONING AT BLOCK AND GRAM PANCHAYAT

1. 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.
2. The number of patch cords to be supplied with the OLTs including additional cards shall be four more than the number of PON ports for each type of OLT (i.e. 8 respectively). The patch cords specification shall be as per TEC GR. Design and specification of accessories at OLT site shall be finalized by BBNL in consultation with PIA
3. Installation of OLT, ONT at the Block and Gram Panchayat respectively in coordination with BBNL. Installation of FDMS and Rack (wherever applicable)
4. PIA shall install and commission Solar Panel (As per BBNL plan and specification) in the respective Gram Panchayat
5. Testing of traffic from the ONT at Gram Panchayat to the Block OLT and further to BBNL central NOC.
6. General site readiness like provisioning of proper earthing, racks installations etc. shall be carried out by the PIA at no extra cost to BBNL.
7. Additionally, in case the Gram Panchayat end point where the ONT has to be installed, does not have appropriate plug points/ wiring, the PIA shall draw the electrical wiring from the nearest junction box to the ONT (with requisite plug points etc.) at no extra cost to BBNL.

2.1.4. ACCEPTANCE TESTING (COMMISSIONING) FOR THE NETWORK (CONNECTIVITY FROM BLOCK TO GRAM PANCHAYAT)

1. The final acceptance (commissioning) shall cover 100% of the network for the Gram Panchayat at Block level, after successful testing by BBNL or its third party agency (TPA)

2. FINAL AT would include installations and commissioning of IT equipment and non-IT equipment at 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 ONT at Gram Panchayat to Block OLT and further to BBNL NOC.

2.1.5. GO-LIVE FOR THE NETWORK (CONNECTIVITY FROM BLOCK TO GRAM PANCHAYAT)

1. The Go-live for the connectivity from Gram Panchayat at Block level shall be considered when 100% implementation and commissioning for the defined locations along with Acceptance testing as envisaged has been completed. The warranty of the complete network shall commence after Go-live of all blocks. However, in case of pendency of GPs for going live due to reasons not attributable to bidder, BBNL reserves the right to award warranty before completion of such GPs with provision to take an under taking from the bidder to make all pending GPs go live , as soon as reasons are sorted out by BBNL.
2. The PIA would submit a Go-Live report to BBNL in this regard detailing the completeness of the activities for the connectivity of GP at Block level. The Go-Live report shall be vetted by BBNL in order to prove that the traffic is flowing through OLT from the respective Gram Panchayat.
3. The connectivity for GP at Block level could be declared Go-Live once ONT of GP is accessible from central BBNL NOC and the report regarding the same has been submitted and accepted by BBNL.

Basic Requirements:

1. The PIA shall be responsible for provisioning of proper earthing for active equipment (OLT, ONTs, etc.) in cases where earthing is not present as per earthing standards.
2. 24fiber shall be used for underground cabling. For aerial, 24 ADSS fiber shall be used depending on the topology of GPs at each Block.

Note:

1. In case any associated component is required not covered in the BoM, BBNL may ask the PIA to procure the associated component so required. The price shall be determined by BBNL and upon approval, the PIA shall install the associated equipment. This shall be dealt on case to case basis.
2. The PIA shall be required to follow the Technical Specification & Testing Parameters as mentioned in Annexure A, Engineering Instructions (EI) (Annexure B) for implementation of the project.
3. Any deviation from the standard EI, shall be liable for penalty as per Annexure B (2).
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. PIA shall obtain necessary Right of Way (RoW) from State/Central agencies whichever applicable. BBNL state units shall facilitate and coordinate for necessary RoW permissions and reimbursement would be done on actual basis for RoW cases of Central Agencies such as NHAI, Railways& Forest. RoW for land areas in states is free of cost from state Government's as part of BharatNet project.

2.1.6. QUALITY ASSURANCE AND TESTING

1. The QA test schedule shall be issued by BBNL.
2. The supply shall be accepted only after Quality Assurance tests are carried out by appropriate Quality Testing Agencies as identified by BBNL.
3. Only for the completed supplies, as per work order issued during delivery period shall be considered to have been supplied within the scheduled delivery period.
4. In case of any Quality issue, the manufacturers shall be required to replace the defective/inferior material, in full, by good material duly passed by QA.
5. The QA units of BSNL/TPA, as specified by BBNL in the Work Order, while clearing the equipment/ stores shall strictly adhere to the package discipline for all item in the Bill of Material mentioned in the Work Order (block wise). Supplies made in full, “as per the work order”, during delivery period only shall deemed to have been supplied within the schedule delivery period.

Annexure-II-B

SCOPE OF WORK AND TECHNICAL SPECIFICATIONS OF GIS MAPPING OF OFC ROUTES FOR BHARATNET

I. This document describes the process

1. For mapping the entire assets on the OFC route e.g. OLT, ONT, Joint, Splitter, Route Indicators, Landmark, Cable Sections and OFC etc. on the GIS platform of BBNL/NIC for laid or being laid BharatNet incremental OFC from FPOI to ONTs at GPs or from Block/OLT to GP as the case may be.
2. To create and submit As Built Drawings (ABDs).

II. Scope of Work

1. Engineering Survey of routes and submission of As Built Drawings (ABDs) in GIS format (Shape Format) of OFC connectivity from BSNL FPOI to respective ONTs in Gram Panchayats (GP).
2. Submission of Routes data in hard copy (A2 for tree & A4 for grids) as well as soft copy.
3. Uploading the data on GIS platform. BBNL/NIC shall provide on line tool for uploading the captured data and information
4. Validation of uploaded data shall be done in three stages:

    a. **First Stage**: The contractor shall verify the data in the tool after uploading it. The data may be verified by the tool itself by checking the alignment of Route indicators and OFC coordinates.

    b. **Second Stage**: Second level validation shall be done by BBNL PMUs.

    c. **Third Stage**: Third level validation shall be done by NIC. If the data correction is required, the same may be sent to the contractor for correction. The contractor shall correct and upload the data again.

III. Guidelines for data uploading and validation:

3.1 **Registration of Users:**

1. Contractor: The Contractor User is allotted a set of OLTs from a Block and is allowed to edit the features only within those OLTs. The Contractor User is created by entering their details such as User Name, Password, Name, Address, E-Mail, selecting the State, District and Block from drop down lists, and by selecting the OLTs from a list within which he/she is allowed to edit.

2. BBNL: BBNL PMU is the one who validates the editing done by the Contractor Users. The BBNL State User is created by selecting the State from a drop down list and entering their other details.
3. NIC: The State User of NIC makes observations on the validations made by the BBNL State User. The NIC State User is also created by selecting the State from a drop down list and entering their other details.

3.2 Uploading and Editing:

The editing module is available for the editing users, and the workflow of the module is as follows:

- The editor will be prompted to select an OLT from a drop down list of all the OLTs that are allotted to that particular user.
- Secondly, the user will choose any one of the following layers to upload, from a drop down list: OLT, ONT, Splitter, Joint, OFC, RI, Landmark.
- On selecting the layer for upload, the user can now upload a shapefile using the upload form provided in the module.
- On uploading the shapefile, the data will be checked to see if the selected OLT has features in that particular layer based on OLT code, if there are features present, those features will be purged from the layer, and the newly uploaded data will be added to the layer.
- In case the OLT does not have any features in that layer, then the data will be added directly to the editing layer.
- Each Layer will have a sample structure, which has to be followed while preparing the shapefile for upload. This sample structure will be available for download through the module.

3.3 Workflow Status:

The status module is available for the all users to monitor the complete status of the OLTs under each state including the dashboard of validation workflow. The module will function as described below:

- The State User will first select the District from within his State from a drop down list.
- The Blocks from the selected drop down list are populated in another drop down, from which the State User can select his desired Block.
- On Selection of the block, the Statistics will be displayed for the following parameters,
    1. Total OLTs in Block
    2. OLTs for which data has been uploaded
    3. OLTs for which the data has been accepted on validation
    4. OLTs for which the data has been rejected on validation
    5. History and current status of pendency in workflow
    6. View observations from NIC
- For the BBNL State User, on click of the Statistics of OLTs for which data has been uploaded, a list displaying the OLTs uploaded by the editors is displayed.
- For the NIC State User, on click of the Statistics of OLTs for which data has been accepted, a list displaying the OLTs validated by the BBNL State User is displayed.
- On selecting any of the OLTs from the aforementioned lists, the State User is directed to the Validation Module.

3.4 Validation Module after Data uploading by contractor:

- Auto Validation
    - After uploading of data, the online tool shall do the necessary validation itself (module to be developed by NIC) at each layer from the data uploaded viz. alignment of RI and line assets etc.
- Contractor User
    - The contractor may edit/upgrade the data from the edit layer based on requirement or suggested by tool itself before submission to BBNL State user.
- **BBNL State User**
    - The user will have to select any one of the layers (OLT, ONT, Splitter, Joint, OFC, RI, and Landmark) to be validated for the selected OLT.
    - A Grid showing a list of the features that have been added by the contractor for that particular layer is displayed.
    - The grid has the following fields,
        - User Name of the Editing User who added the feature
        - Time Stamp of when the feature was added.
        - Layer Important fields used to identify the feature.
        - Accept/Reject button.
    - On accept, the data is added to the main layer from the editing layer and sent to NIC for third stage validation.
    - On reject, the data is sent back to the contractor user along with the remarks that are added by the BBNL State User.
- **NIC User**
    - The user will have to select any one of the layers (OLT, ONT, Splitter, Joint, OFC, RI, and Landmark) to be observed for the selected OLT.
    - A Grid showing a list of the features that has been validated by the BBNL State User for that particular layer is displayed.
    - The grid has the following fields,
        - User Name of the Editing User who added the feature
        - Time Stamp of when the feature was added.
        - Layer Important fields used to identify the feature.
        - “Observations” button.
    - On clicking “Observations”, the NIC Statue User can enter the observations he/she has made for that particular feature.

- In case of OLTs that have been uploaded by the editor, the NIC State user should only be able to see the features in a grid.

IV. GIS data specifications:

1. Format: .shp format with mapping on GCS projection system with WGS 84 datum.
2. Base Map for Validation: NIC Base map.
3. Codification and Layer structure will be provided by BBNL/NIC.
4. Uploading of geo tagged site images of designated locations of specified size e.g. 500 kb. The Mobile App developed/to be developed by BBNL/NIC can also be used wherever required. Photos taken from site shall be optimized by the tool itself as per requirement.
5. Calibration: Recording PON OTDR readings for calibration on each end of OLT,

   Splitter, Joint and ONT along with the coil length on each side.

V. ABD Specifications:

1. OFC Alignment Details: ABDs shall be prepared in two parts.
2. Part I: showing the overall cable laying routes for a block or tree from OLT/FPOI to the ONT/FTB which shall identify the various cable laying sections and assets.
3. Part II: shall contain detailed drawings of the various cable sections as depicted in Part I mentioned above. i.e. OFC route to be bifurcated in number of Grids of 200 to 250 meters and each Grid to be prepared in separate sheet (A4) with following complete details:
4. Each sheet has to be assigned a unique number.
5. 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.
6. Three point's references need to be shown for every joint chamber/Pull through Chamber/Manholes.
7. 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.
8. Overhead or Underground alignment, type of execution (HDD, OT, Aerial etc.), OFC protection used.
9. The details of all assets to be tabulated.
10. 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.

1. Name of the Project Organization.
2. Name of the OFC Link with ID.
3. Name of the Contractor.
4. Name of Survey Agency Rep as part of Acceptance Test.
5. Name of BBNL Rep as part of Acceptance Test.
6. Date of commencement of work.
7. Date of completion of work.

VI. General Specifications for both GIS mapping and ABD:

1. Position of OFC Route @ every 10 Meter from the offset, Centre of Road.
2. Overhead or Underground alignment, type of execution (HDD, OT, Aerial etc.).
3. Depth of OFC (Recorded at the time of deployment), count of terminated and spare fibers,loop, make and size of cable deployed, Optical test results for each fibre.
4. Route marker details: Cement/electronic Route Marker (Lat-Long) details Route Marker Identification.
5. 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.
6. Other Operators/Utility: Presence of underground OFC of other operators, utility pipes, transmission cable etc. to be captured in drawing.
7. 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.
8. Position of OLT, ONT, FPOI, Splitter, OFC Joints, Couplers, Manholes, Milestones, Culverts, Bridges/ nallah, water bodies, cross roads, railway crossings, flyovers etc. to be recorded in drawing.
9. Readings should invariably be recorded at every bend on the road, road/railway crossings, culverts, diversion etc. at every 5 meters.
10. For point feature like poles, trees, sewerage man holes, 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.
11. For all the linear features, geo coordinates shall be recorded at every turning point.
12. For all the utilities above ground viz. Poles, Manholes, and telecom nodes like BTS and telephone exchanges etc, details shall be recorded in a corridor of 50m (25m on either side of the road center line or ROW of road whichever is more).
13. To and/or from direction to village, town, city etc. shall be recorded for all roads.
14. All the road KM stones shall be recorded and shown in drawing using symbol provided.
15. All the property boundaries with in the corridor shall be recorded and shown in drawing.

16. 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 obtained.

ANNEXURE-II -C

ENGINEERING INSTRUCTIONS FOR UNDER GROUND OPTICAL FIBER CABLE LAYING WORKS

1. SCOPE

1.1 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.

2. OF CABLE LAYING APPROACH

2.1 On the basis of the survey reports done by PIA and further approved by BBNL, 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 BBNL/ITI will facilitate the PIA.

2.2 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 of 0.6 meter from the outer edge of the road embankment provided the same is located at least 4.5 meters away from center line of road.

3. GENERAL

3.1. 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 chiselling. All other types of soils shall be categorized as Non Rocky including Murrum & soil mixed with stone or soft rock.

3.1.1. 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.

3.1.2. Non Rocky soils

This will include all types of soil- soft soil/hard soil/Murrum i.e. any strata, such as sand, gravel, loam, clay, mud, black cotton murrum, shingle, river or nullah bed boulders, soling of roads, paths etc. (All such soils shall be sub-classified as kachcha soil) and hard core, macadam surface of any description (water bound, grouted tarmac etc.), CC roads and pavements, bituminous roads, bridges, culverts (All such soils shall be classified as Pucca soils)

4. The Optical Fiber 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:

4.1 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 BBNL 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 BBNL.

4.2Laying 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.

4.3 Providing additional protection by R.C.C. Pipes/GI pipes and/or concreting/chambering, wherever required according to construction specification.

4.4 Fixing of GI pipes/troughs with clamps on culverts/bridges and/or chambering or concreting of G.I. Pipes/troughs, wherever necessary. Normally, RCC/DWC pipes shall be used and use of GI pipes shall be avoided. However, in case it is felt that GI pipe is unavoidable in certain circumstances this should be done with the prior approval of competent authority within the concerned BBNL. This shall be recorded appropriately.

4.5 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 BBNL as per construction specification.

4.6 Back filling and Dressing of the Trench according to construction specifications.

4.7 Making manhole of size (2.0 m length x 1.0 m width x 1.65 m Depth) 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 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.

4.8 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.

4.9 Digging of pits 500 cm to 1000 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 “BBNL”, as per construction specification.

4.10 Specifications of Materials to be used

4.10.1. 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 No. TEC/GR/TX/CDS-008/03/MAR-11 with latest Amendments. The Ducts shall be blue in colour and have the identification markings as per TEC GR wherein BBNL logo shall be marked as purchaser's name.

4.10.2. PLB HDPE Duct Accessories

a) Push fit Coupler

Push Fit couplers shall be used for coupling PLB HDPE ducts/coils. The specifications of the couplers shall be as per TECGR no TEC/GR/TX/CDS-008/03/Mar11 with latest amendments.

b) PP Rope

Should confirm to TEC GR No.TEC/GR/TX/CDS-008/03/MAR-11 with latest Amendments. However, this is optional and CPSUs may use the same on need basis. The PP rope can be ordered along with the PLB duct as required. In this case PP ropes drawn through the HDPE/PLB pipes/coils and safely tied to the end caps at either ends with hooks to facilitate pulling of the OF cables at a later stage. The rope used is 3 strands Polypropylene Para Pro rope having yellow colour and size of 6 mm diameter. It should have a minimum breaking strength of 550 kgs. The length of each coil of rope should be 5 meter more than the standard length of duct(or as ordered) and it should conform to (i) BS 4928 Part-II of 1974 (ii) IS 5175 of 1982. It should be of special grade and should have ISI certificate mark. It should be manufactured out of industrial quality Polypropylene.

c) 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/TX/CDS-008/03/MAR-11with 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)

d) 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 closing40mm/33mm PLB HDPE ducts/coils.

The Cable sealing plug shall confirm to TEC GR No. TEC/GR/TX/CDS-008/03/MAR-11 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.)

5. Material for Providing Additional Protection

5.1 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 2meters.

5.2 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.

5.3 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 100mminternal dia.(Spotted), Class--NP-3, Thickness: 25mm, Length: 2Meters with inbuilt collaret one end, conforming to ISI Specification IS: 458, 1988 with latest amendment.

5.4 G.I. Pipes: G.I. pipes should be of medium duty class having inner diameter of 50mmandshould conform to specifications as per IS 554/1985 (revised upto date) IS 1989 (Part-I), 1900 Sockets (revised up to date) & IS 1239 (Part-II) 1992 (revised upto date).

5.5 DWC Pipes: Use of normal duty DWC (Double walled corrugated) HDPE pipe – confirming to TEC GR no.GR/DWC-34/01 Sep.2007 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.

5.6 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 weld mesh 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.

5.7 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 BBNL.

5.8 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)

5.9 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 Projects.

6. EXACAVATION OF TRENCHES

6.1. Trenching

6.1.1. 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 BBNL

Once the alignment is marked, no deviation from the alignment is permissible except with the approval of BBNL. While marking the alignment only the center line will be marked and the PIA shall set out all other work to ensure that, the excavated trench is as straight as possible. The PIA shall provide all necessary assistance and labor, at his own cost for marking the alignment. PIA 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 PIA 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.

6.1.2. 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.

6.2. Method of Excavation

6.2.1. 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.

6.2.2. 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.

6.2.3. 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.

6.2.4. 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.

6.2.5. 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 chiselling/ jack hammers.

6.2.6. 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.

6.2.7. 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.

6.2.8. 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.

6.2.9. 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.

6.3. 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 BBNL 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 BBNL. 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 BBNL 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 BBNL in writing under genuine circumstances. The decision of the BBNL 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 BBNL.

6.3.1. 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.

6.3.2. 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.

6.3.3. Blasting: For excavation in hard rock, where blasting operations are considered necessary, the PIA shall obtain approval of the BBNL in writing for resorting to blasting operation. The PIA shall obtain license from the BBNL 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 BBNL 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 BBNL. 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.

6.3.4. 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 BBNL. 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.

6.3.5. 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.

7. 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 Fiber 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 BBNL. 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. BBNL shall decide about such stretches and type of protection to be provided

in view of the site requirements. Normally 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 BBNL. 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 compositions 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 BBNL.

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 BBNL 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 BBNL. The mechanical protection shall extend at least 5 meters beyond the bed of nallah on either side. Not with standing anything contained in clauses referred above, the BBNL may order, based on special site requirements, that the PLB HDPE Ducts may be encased in reinforced cement concrete, as detailed, I bid. 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 BBNL. The location of the manholes will be decided by the BBNL

7.1. 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 BBNL. 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.

7.1.1. 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.

7.1.2. 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.

7.1.3. 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 BBNL 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.

8. 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.

9. 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

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.

10. CABLE PULLING AND JOINING/SPLICING

10.1. 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 Fiber cables are available in drums in lengths of approx. 2 km. 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 Fibers.

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 BBNL. 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.

10.2. Jointing/ Splicing

Optical Fiber Cable Joints will be at varying distances depending upon the incremental fiber to be laid for connecting Panchayats. The 24 fibers are to be spliced at every Joint & at both ends (Terminations) in the equipment room as directed by the BBNL. The Infrastructure required for cable splicing i.e.

Splicing machine

OTDR

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 Fiber Cable thus jointed end-to-end will be tested by the BBNL/TPA officer of Acceptance Testing unit of the concerned BBNL for splice losses and transmission parameters as specified by BBNL and prevalent at that time. The through Optical Fiber should meet all the technical parameters, specified and no relaxation will be granted.

11. 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 Fiber 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. The location is finalized by BBNL.

The jointing chambers are constructed by way of fixing pre-cast RCC chambers/Brick Chambers and covers as per the instructions from BBNL.

11.1. Pre cast RCC chamber

For fixing pre cast RCC chamber, first a pit of size 2 m x 2 m x 1.8 m depth shall be required to be dug. Pre cast 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 'BBNL 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.

11.2. 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

12. **Fixing of Route Indicators / Joint Indicators**

Pits shall be dug 500 cm to 1000 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.

12.1. 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')

12.2.Stone based Route Indicators

The route /joint indicators made of Sand/lime Stone Should have the following dimension. The word 'BBNL OFC' should be engraved on the Route/Joint indicators.

i. Stone to be used (Sand/lime Stone)
ii. Indicator Top surface to be rounded
iii. Base 155 mm × 100 mm
iv. Upper 500 mm length to be Tapered width wise as shown in the drawing and homogeneously finished.
v. Height 650mm (Straight) + 400 mm (Tapered)
vi. The route indicators should be engraved with word 'OFC' of size 80mm length & 50mm, width.
vii. Length 3.5 Ft., top 4"x4" dressed 1Ft. from top & tapered.

(See figure '6' for details of Stone Route Indicators)

The Route indicators shall painted Blue and placed at 500 to 1000 cm away from the centre of the trench towards jungle side. The Joint indicators are placed at OFC joints and placed 500 to 1000 cm away from wall of the joint chamber facing jungle side and are painted Grey. The engraved word "BBNL 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 2ndjoint. 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:

viii. For Joint Indicator: Grey colour
ix. For Route Indicator: Blue colour
x. For BBNL OFC & Nos: White colour.

13. 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.

13.1 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.

13.2 Route Index Diagrams –Profile

These diagrams will contain

I. Make and size of the cable.

II. Offset of cable from centre of the road at every 10 meters

III. Depth profile of Cable at every 10 meter;

IV. Details of protection with type of protection depicted on it;

V. Location of culvert and bridges with their lengths and scheme of laying of PLB HDPE Ducts pipe thereon.

VI. 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.

13.1. Joint Location Diagram

This diagram will show

I. Geographical location of all the joints.

II. Depth of Joint Chamber covers from ground level

III. Type of chamber (Brick/Pre-cast)

IV. 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 BBNL 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.

V. Name of the State/District/Block

VI. Name of the Panchayats connected

VII. Name of the BBNL with logo

VIII. Name of the PIA

IX. Date of commencement of work

X. Date of completion of work

For each Block 1 sets of above mentioned document shall be submitted to BBNL.

14. SAFETY PRECAUTIONS

14.1. Safety Precautions when excavating or working in excavations close to electric cables

The Officer in charge (BBNL) 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 Final ATal in several cases.

14.2. 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.

14.3. 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.

14.4. 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.

14.5. 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.

14.6. 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.

14.7. 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.

14.8. 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 suchtemporary 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.

14.9. 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.

14.10. 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.

14.11. 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:

I. Gun powder

II. Nitrate Mixture

III. Gelatine

IV. Safety fuse

V. Electric Detonator

VI. Ordinary Detonator

14.11.1. 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 theroute 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 BBNL 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.

14.11.2. 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.

14.11.3. 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.

14.11.4. Warning

There may be two reasons for unsatisfactory results of the blasting

I. Misfire of Gelatin due to leakage of current from detonator.

II. Over loading because of overburdens.

III. 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.

14.12. Precautions

The abstract of Explosives Rules 1983 which are relevant to our work is given below:

14.12.1. 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.

14.12.2. 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.

14.12.3. 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.

14.12.4. 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.

14.12.5. 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.

14.12.6. 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.

14.12.7. 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.

14.12.8. 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.

14.12.9. 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 of2.5 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 BBNL shall also be informed by the agent of all cases of misfire, their cause and steps taken in that connection.

14.12.10. 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 BBNL in writing.

14.12.11. 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 BBNL or his authorized representative before resuming the blasting or returning the consignment.

14.12.12. 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.

15. ALLIEDACTIVITIES

15.1. 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 BBNL.

15.2. Transportation of Materials: The PIA shall be responsible for transporting the materials, to be supplied by the BBNL 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.

15.3. 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.

15.3.1. 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.

15.3.2. The PIA shall not be allowed to dump the empty cable drums in Govt. /Public place which may cause inconvenience to the BBNL / public. If the PIA does not dispose of the empty cable drums within 3 days of becoming it empty, the BBNL 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.

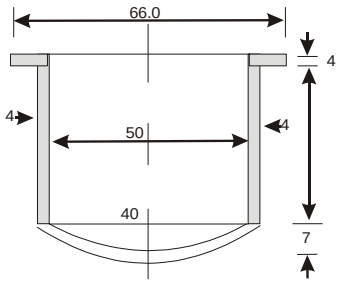
15.4. Supply of Materials: There are some materials(Accessories) other than as mention in BoQ required to be supplied by the PIA for execution of work under this contract like Bricks, Cement, Wire Mesh and Steel for protection, etc., besides using other consumables which do/don't become the part of the 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.

15.5. 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.

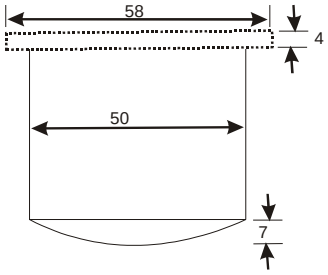
Note: All the materials as above have to be TSEC/Type approved by BSNL QA/TEC against mentioned TEC GR or as per the approval procedure of BBNL for which TEC GR not there.

Figure 1

HDPE END CAPS



SECTION ON A.B



FRONT ELEVATION

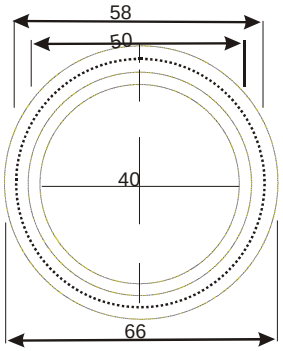
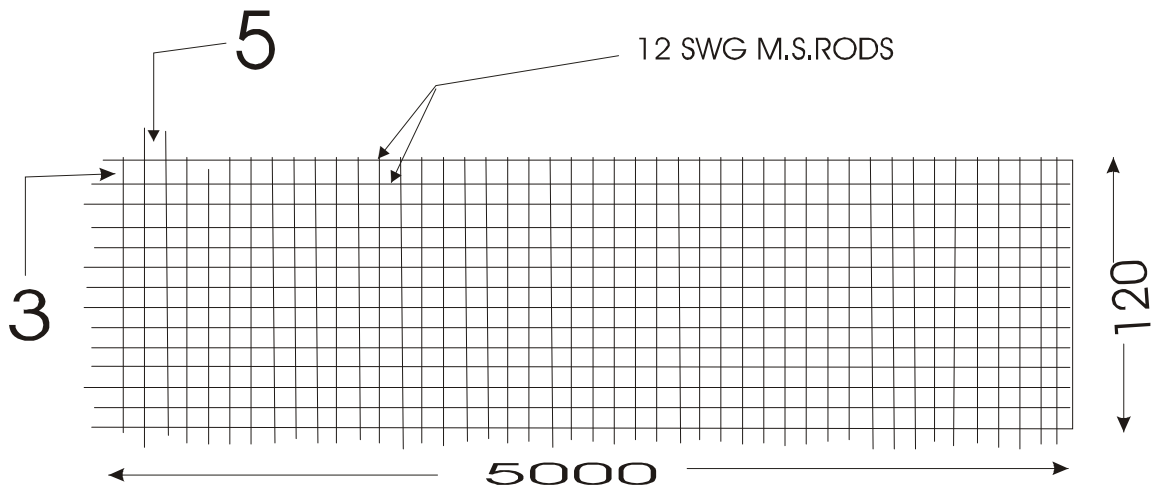


Figure 2

M.S. WELDMESH

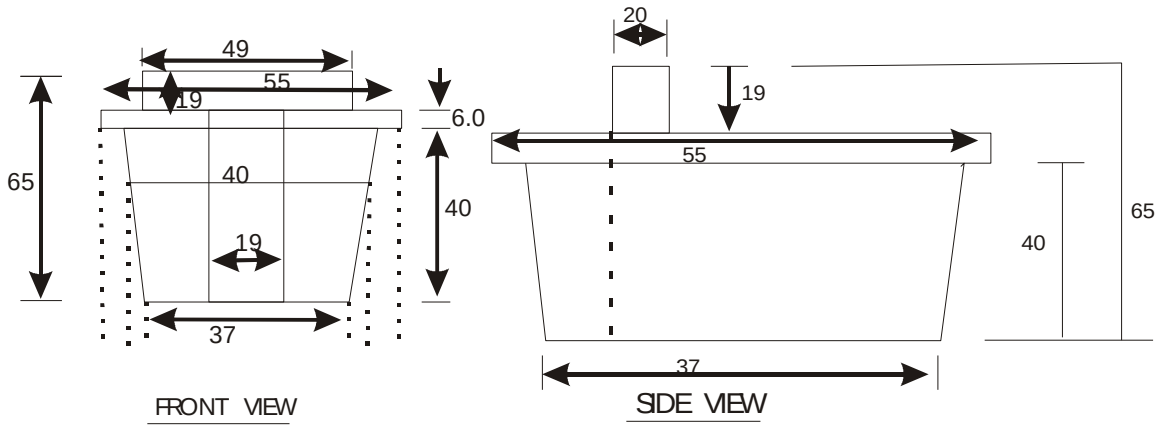
DETAILS OF 100 MM X 50 MM, 12 SWG MILD STEEL WELD MESH HAVING WIDTH OF 120 CM.

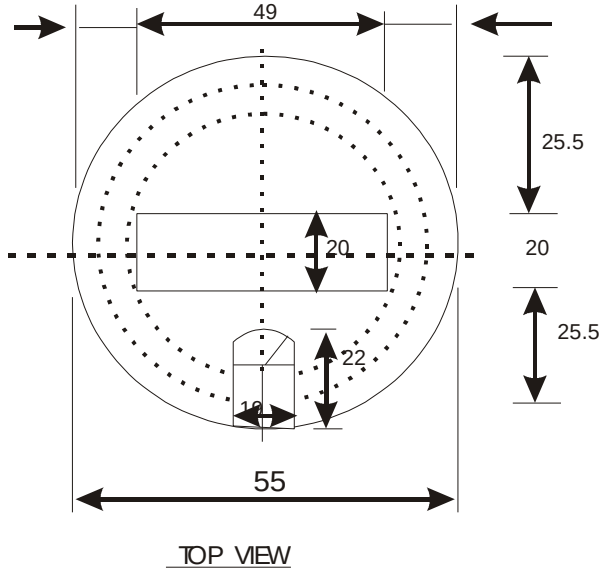


Note: All measurements are in centimetres.

Figure 3

Rubber Cork



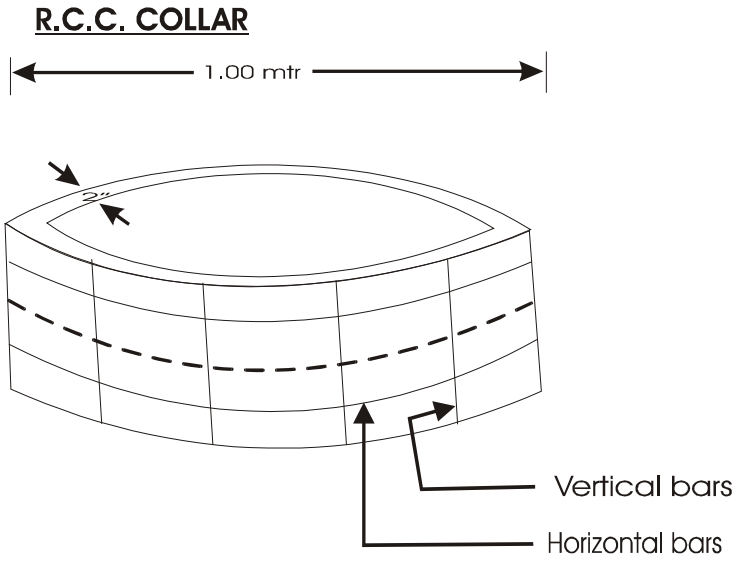


NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. DIMENSIONS ARE ONLY FOR GUIDENCE. TAPPER SHOULD BE SUCH THAT IT SHOULD TIGHTLY FIX. INTO TYPE A & TYPE B HOPE 50 mm OO PIPES.

Figure 4

SPECIFICATION AND REINFORCEMENT DETAILS OFR.C.C. JOINT PROTECTION CHAMBERS



Specification:

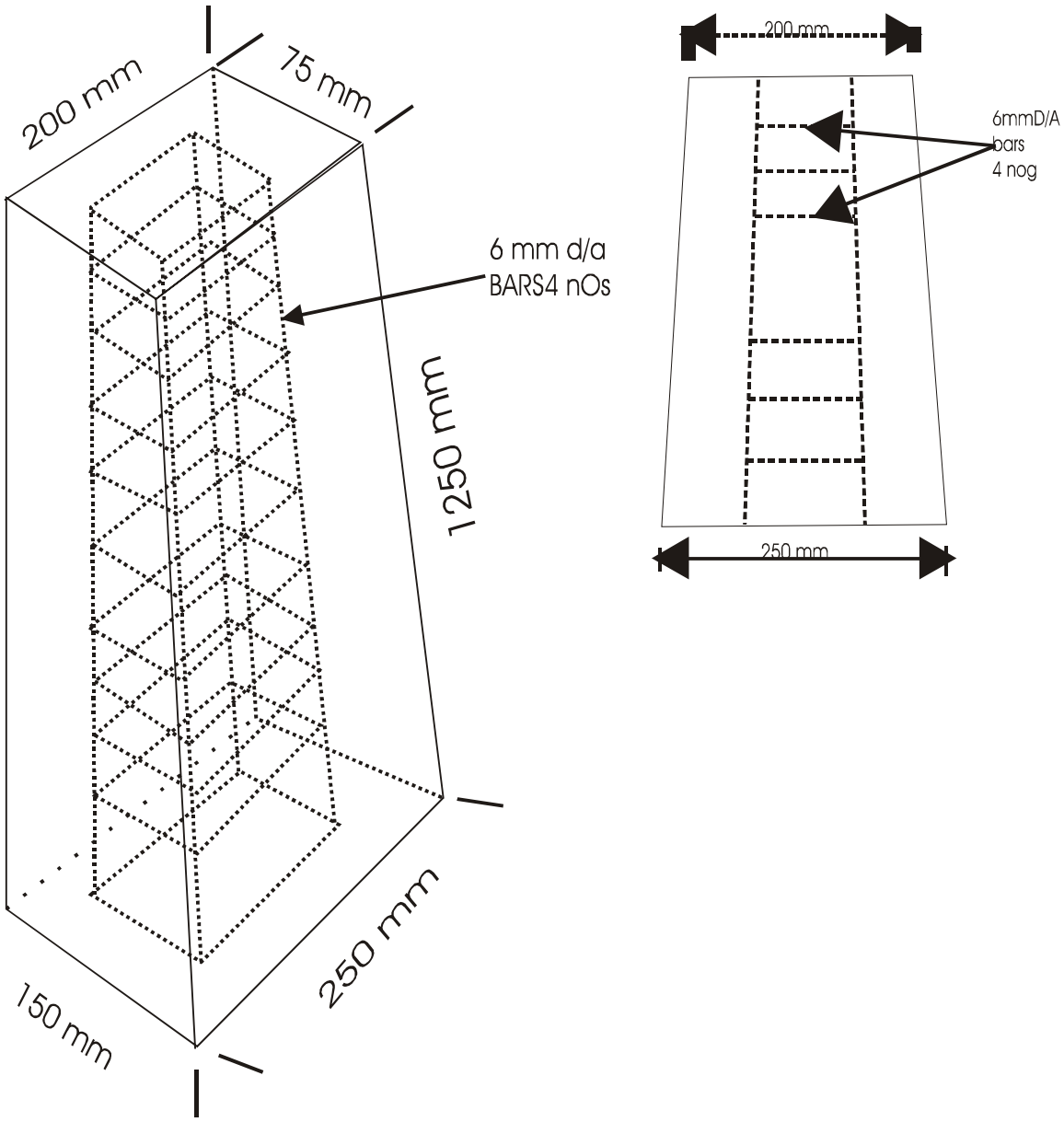
1. Diameter: 1.00 Mtr. (inner side)
2. Thickness: 5 cm.
3. Height: 50 cm.
4. 6 mm Horizontal Iron round rings – 4 Nos.
5. 6 mm vertical bars Iron – 12 mm Nos.
6. 12-gauge GI wire mesh to be wrapped before reinforcing the concrete.

Note:

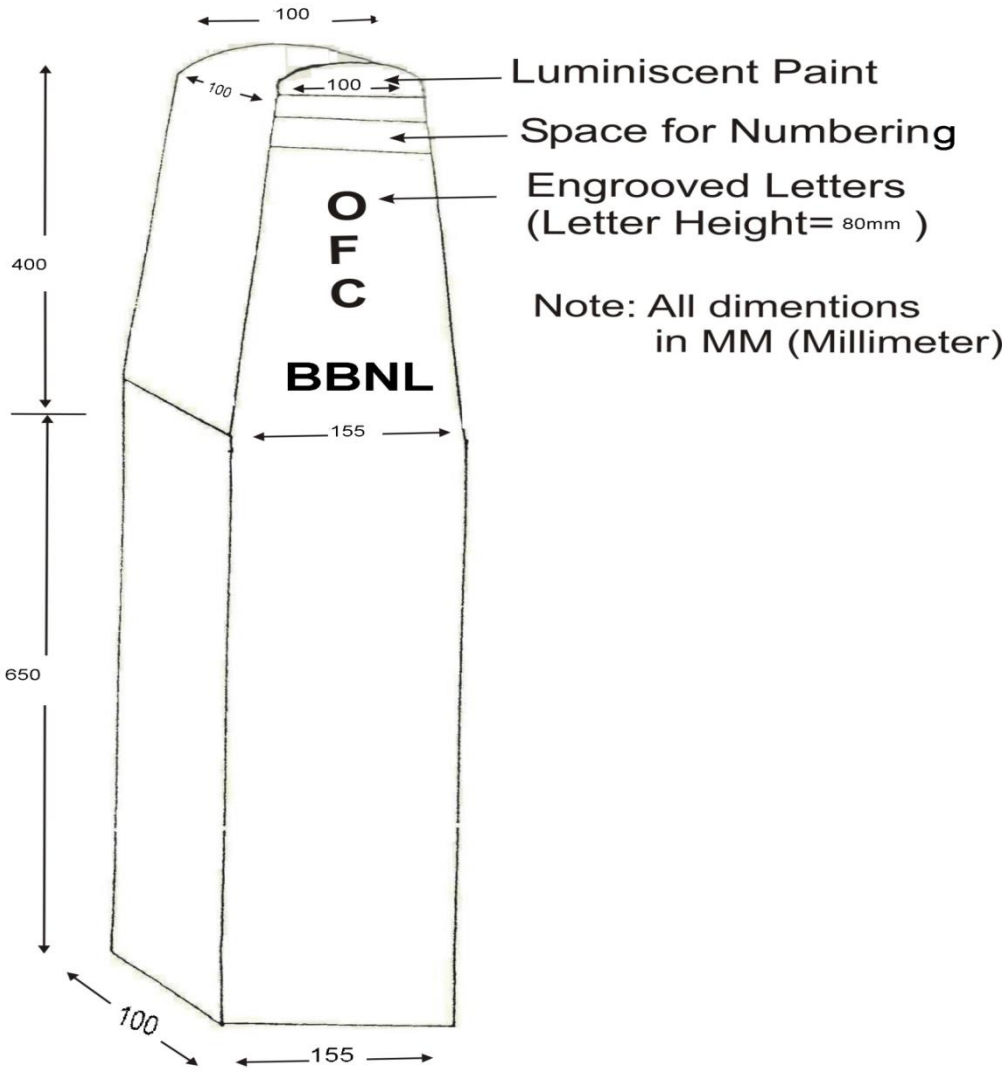
a) Concrete 'Mix. 1: 2:3 (1 Cement: 2 Sand: 3 graded Stone aggregate 20 mm nominal size.
b) Finishing: Smooth

Figure 5

RCC Route Indicator



1. Stone OFC Route Indicator



Abbreviations

1.	DOT	: Department of Telecom
2.	BBNL	: Bharat Broadband Network Limited
3.	BSNL	: Bharat Sanchar Nigam Limited
4.	TEC	: Telecom Engineering Centre
5.	HDPE	: High Density Polyethylene
6.	DWC Ducts	: Double Walled Corrugated Ducts
7.	GI pipe	: Galvanized Iron Pipe
8.	ASTM	: American Society for Testing and materials
9.	GR	: Generic Requirement
10.	CACT	: Component Approval Centre for Telecom
11.	RCC	: Reinforced Cement concrete

Annexure-III

ENGINEERING INSTRUCTIONS FOR INSTALLATION OF AERIAL OFC

INSTALLATION PRACTICE OFSELF SUPPORTING METAL FREE AERIAL OPTICAL FIBER CABLE

1. SCOPE:

This Engineering Instruction (EI) deals with the guidelines and the installation practice for installing self-supporting metal free aerial optical Fiber cable.

2. GENERAL:

Department Of Telecommunication has already introduced self-supporting metal free aerial optical Fiber cable for local junctions and short haul trunk working. This is particularly useful in situations where underground cable laying is not possible. It is also recommended for short term working.

3. ROUTE SURVEY:

The route should be inspected before the actual installation of optical Fiber cables. Survey of the aerial route should be carried out pole by pole.

4. 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.

5. LINE DIAGRAM:

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). Additional poles should be erected if required to keep the span length within the specified limits. Care should be taken that the alignment is easily accessible from the road. It is necessary to keep clear head way (Ground clearance) of 12 to 15 feet in a section. A complete line diagram should be prepared i.e. from station A to station B. The number of road crossings, canals or nallahs, electric lines should be clearly marked in the route diagram.

6. HILLY REGIONS:

Line erection rules must be strictly followed. Additional poles may be erected for better support to optical Fiber cable &to avoid sharp curves & bends. Span lengths should be reduced to avoid sags in case of steep slopes.

7. 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 Fiber cable. These fittings relieve the optical Fiber cable of its compressive, bending & clamping stresses. The performed dead end fittings are suitably gritted for excellent tensile holding strength.

6.2 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.

8. SUSPENSION POLES:

The suspension pole assembly is designed to offer cushion to aerial optical Fiber cable against the dynamic stress of Aeolian vibration at the suspension point. They also reduce static stresses at the Support point.

6.2 SELECTION POLES:

6.1 Selection of suspension poles also depends upon actual site location of route.

6.1 All the intermediate poles between two tension poles will be suspension poles.

9. 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.

10. AERIAL OPTICAL FIBER CABLE SPECIFICATIONS:

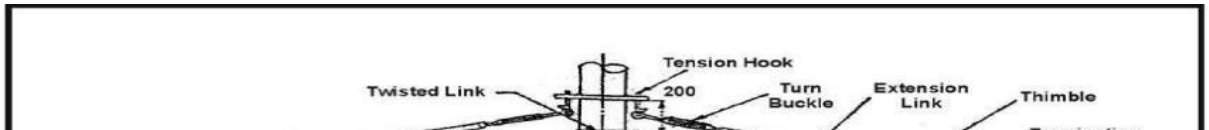
1.	Maximum span length	:	100 metres
2.	Maximum span length	:	100 metres
3.	Operational wind velocity	:	75Kms per hour
4.	Maximum sag allowed (Without excess load)	:	2% of span length
5.	Maximum sag allowed (With excess load)	:	3% of span length
6.	Temperature range operation & storage	:	-30 to +70 degree C
7.	Installation	:	-15 to +50 degree C
	Minimum bend radius	:	2D (D- Dia of cable)
8.	Tensile force During installation	:	9.81 x 1.3 x **w**
9.	Permanent with ice & wind load:	:	9.81 x 3 x **w**

(Where **w** is the mass of 1 km length of cable, in kg)

11. TYPES OF ACCESSORIES AND FIXTURES:

6.2 FORMED OFC DEAD END AND TERMINATION FITTINGS:

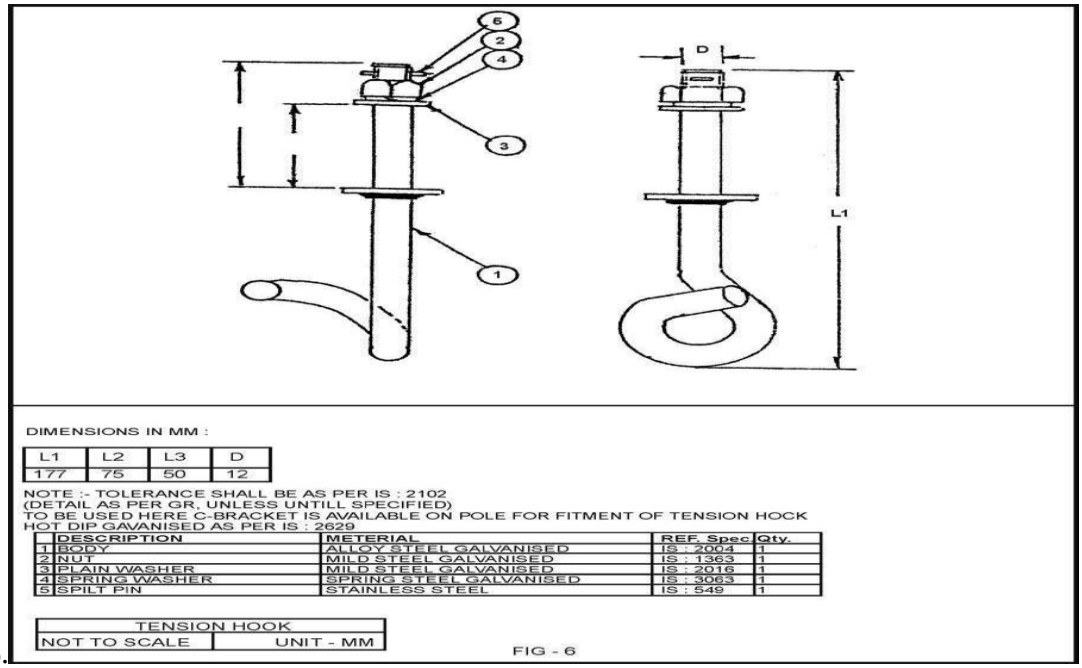
These fittings are used at tension/termination poles (dead end poles), or poles where splices are located and the poles where the overhead alignment takes a turn, (angle exceeding more than 15 degrees) as shown in below fig. 1.



6.2 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.

6.



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

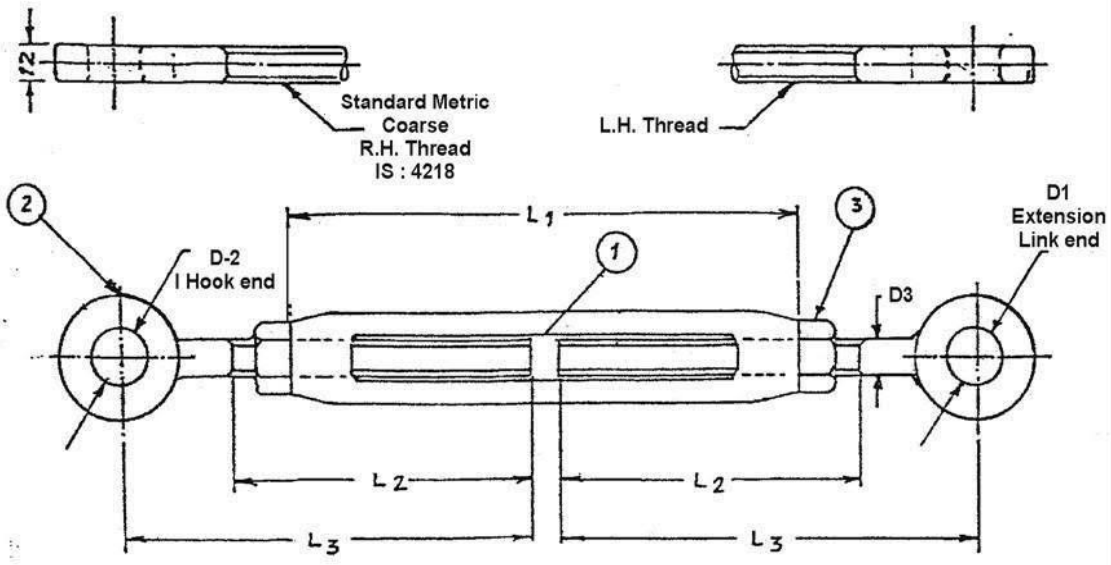
	DESCRIPTION	METERIAL	REF. Spec	Qty.
1	BODY	ALLOY STEEL GALVANISED	IS : 2004	1
2	NUT	MILD STEEL GALVANISED	IS : 1363	1
3	PLAIN WASHER	MILD STEEL GALVANISED	IS : 2016	1
4	SPRING WASHER	SPRING STEEL GALVANISED	IS : 3063	1
5	SPILT PIN	STAINLESS STEEL	IS : 549	1

TENSION HOOK	
NOT TO SCALE	UNIT - MM

FIG - 6

6.2 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. 7.



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

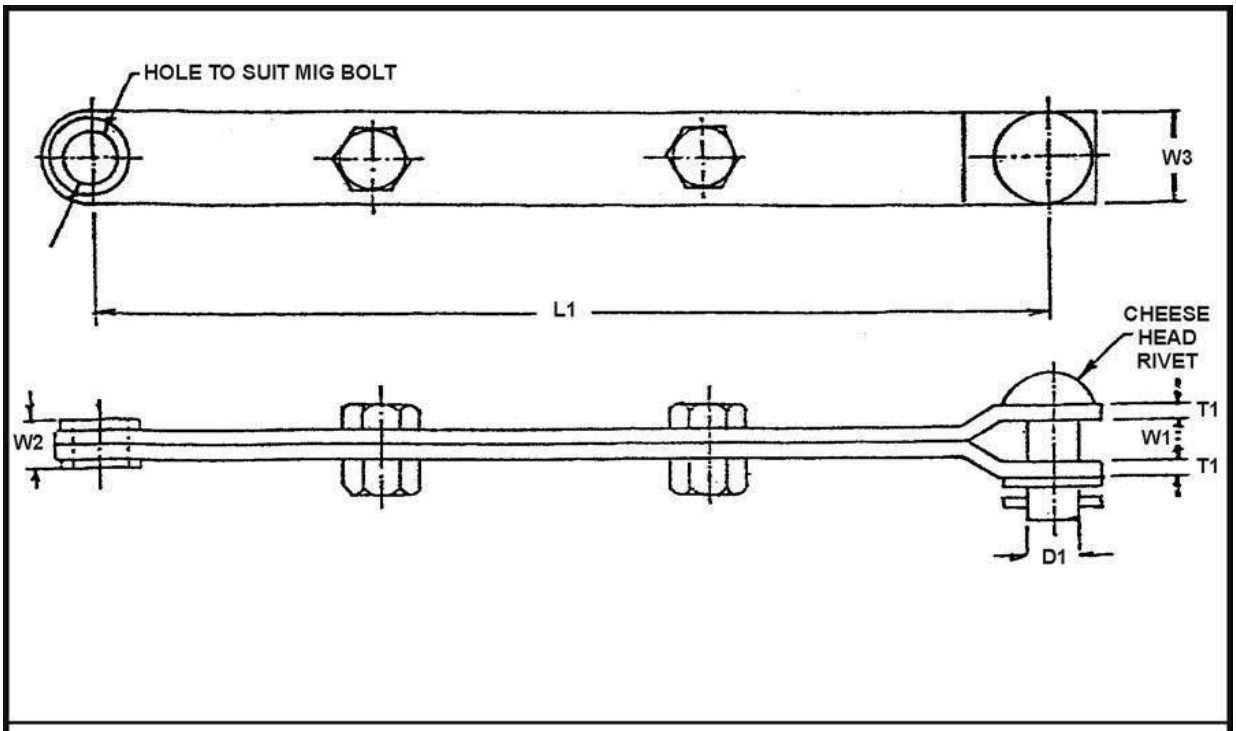
	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	BODY	MILD STEEL FORGED GLAV.	IS : 2004	1
2	NUT BOLT	MILD STEEL FORGED GLAV.	IS : 2062	2
3	NUT	MILD STEEL	IS : 1363	2

TURN BUCKLE	
NOT TO SCALE	UNIT - MM

FIG - 7

6.2 EXTENSION LINK:

Galvanized steel extension link is used along with turn buckle as shown in fig. 8.



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

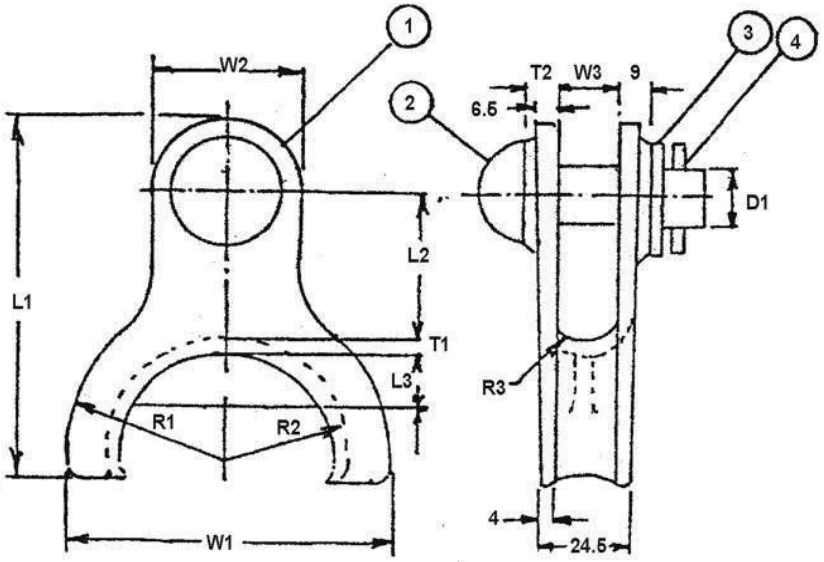
	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	STRAP	MILD STEEL GALVANISED.	IS : 2067	1
2	RIVET & WASHER	MILD STEEL GALVANISED	IS : 2016	1
3	SPLIT PIN	STAINLESS STEEL	IS : 549	1
4	BOLT & NUT M 16	MILD STEEL GALVANISED	IS : 1363	1

EXTENSION LINK	
NOT TO SCALE	UNIT - MM

FIG - 8

6.2 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.9.



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)

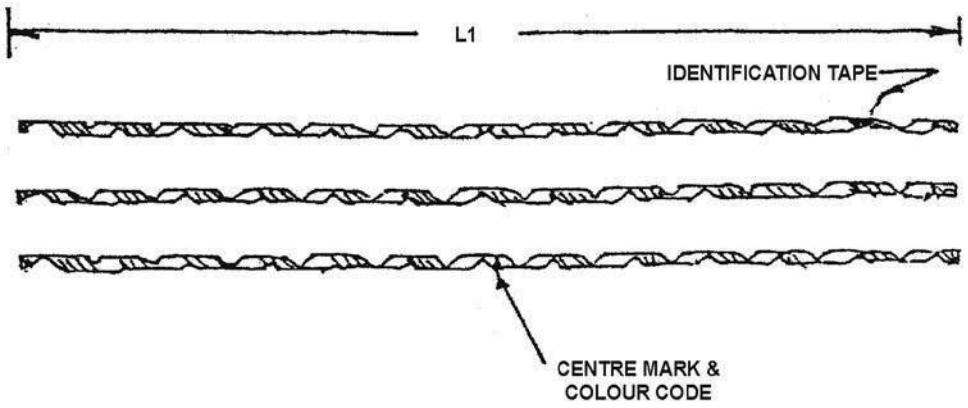
FEROUS PARTS ARE HOR DIP GALVANISED
AS PER IS : 2629

	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

6.2 PROTECTIVE HELIX (T): Set of aluminium alloy helically formed protective helix having predetermined spiral shape is used & making them conveniently applied on the optical Fiber cable without excessive clamping pressure at any point. See fig.11.



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

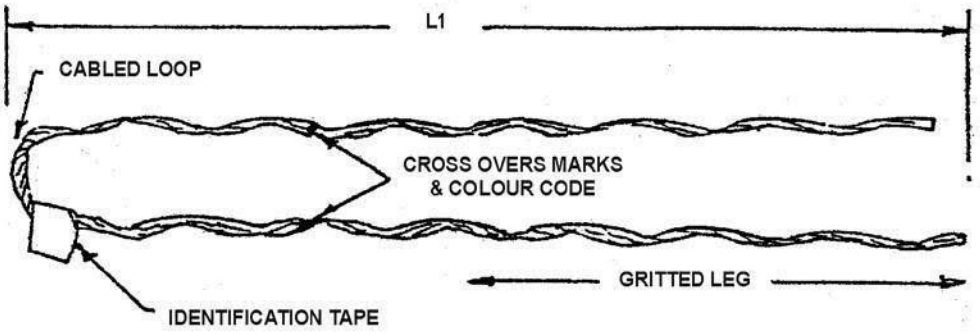
NOTE : ENDS OF RODS SHALL BE DEBURRED TOLERANCE SHALL BE AS PER IS : 2102 (DETAIL AS PER GR, UNLESS UNTILL SPECIFIED)

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	PROTECTIVE HELIX	ALUMINIUM ALLOY 6061		

PROTECTIVE HELIX (T)	
NOT TO SCALE	UNIT - MM

FIG - 11

6.3 **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 Fibercable.Seefig.12.



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)

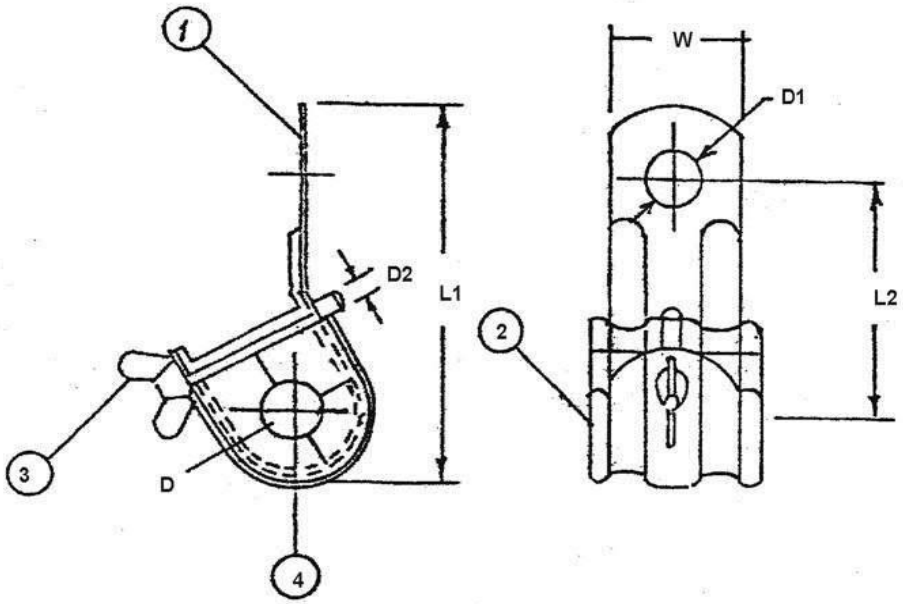
DIMENSION DETAIL FOR DIFFERE CABLE SIZES TO BE DECIDED AP TYPE TEST APPROVAL
FOR EXAMPLE CABLE SIZE
ENDS OF RODS SHALL BE DEBUR LENGTH OF TERMINATING HELIX 1000 MM,
TER MINATING HELIX TO BE USED WITH THIMBLE C DIA - 14.4 MM

	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	DEADEHD GRIP	ALUMINISED STEEL		

TERMINATING HELIX	
NOT TO SCALE	UNIT - MM

FIG - 12

6.2 JUMPER CABLE CLAMP: Galvanized steel jumper cable clamp is used to support the through length of optical Fiber cable at the intermediate tension poles as shown in fig. 15.



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

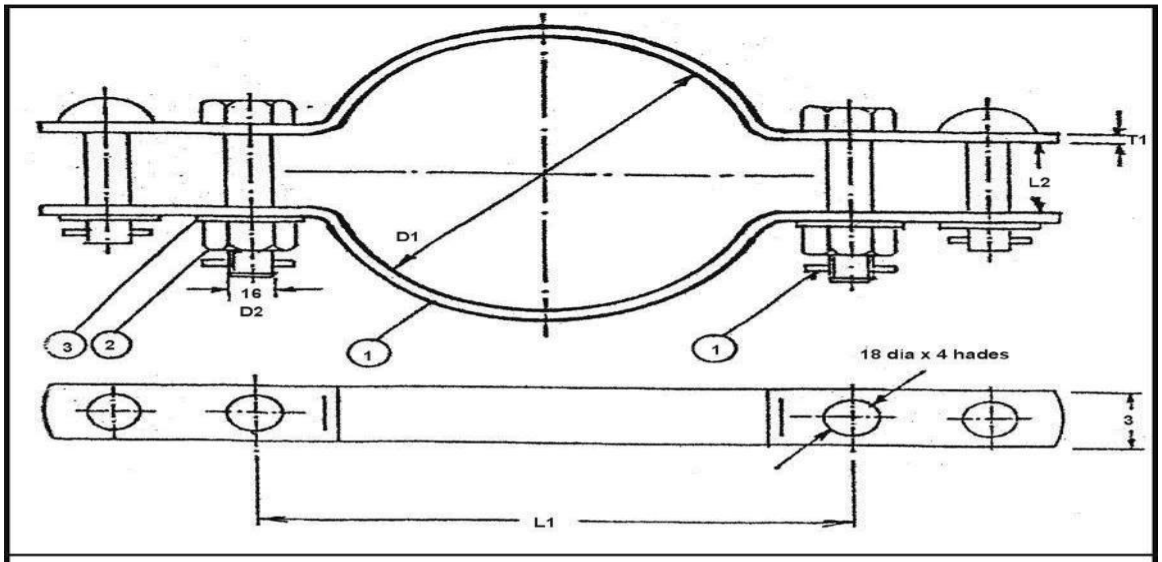
JUMPER CABLE CLAMP	
NOT TO SCALE	UNIT - MM

FIG - 15

6.2 POLE MOUNTED STAY CLAMP (RAIL) OR POLE MOUNTED STAY CLAMP (TUBULAR)

Galvanized mild steel pole mounted stay clamp should be used at the pole for the fixing with a twisted eye & turn buckle; see figs.4 & 5. The selection of the type of stay clamp will depend upon the type of poles.

POLE MOUNTED STAY CLAMP (RAIL)



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

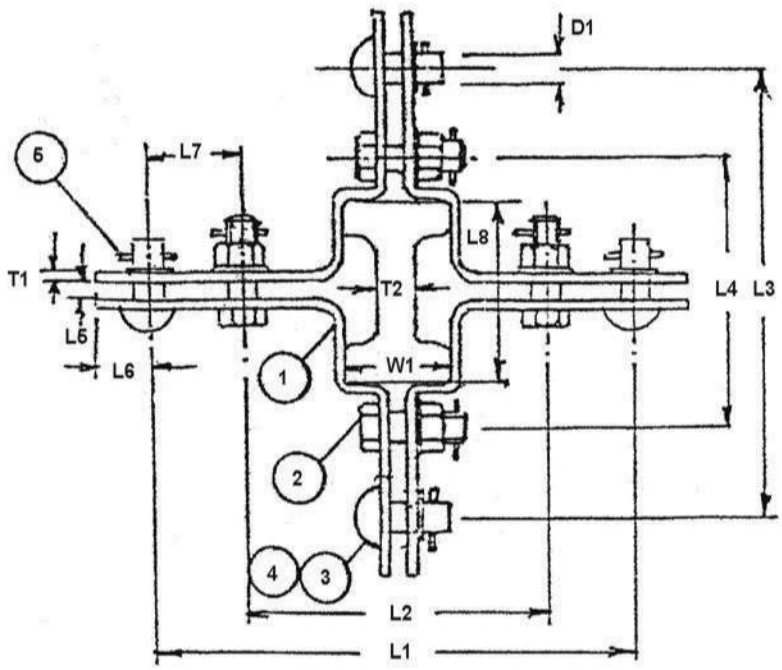
NOTE :- TOLERANCE SHALL BE AS PER IS : 2102
(DETAIL AS PER GR UNLESS UNTILL SPECIFIED)
HOT dIP Galvainised as per is : 2629

	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

POLE MOUNTED STAY CLAMP (TUBULAR)



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

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. 2.

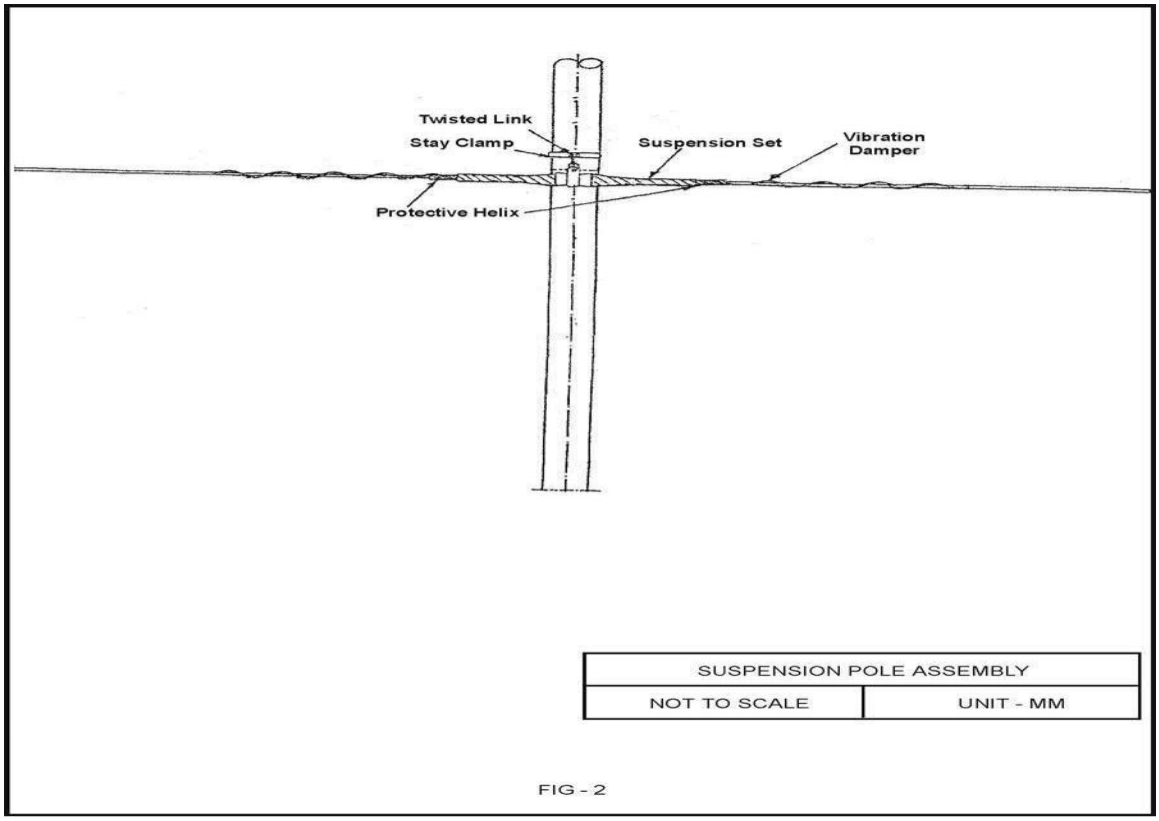
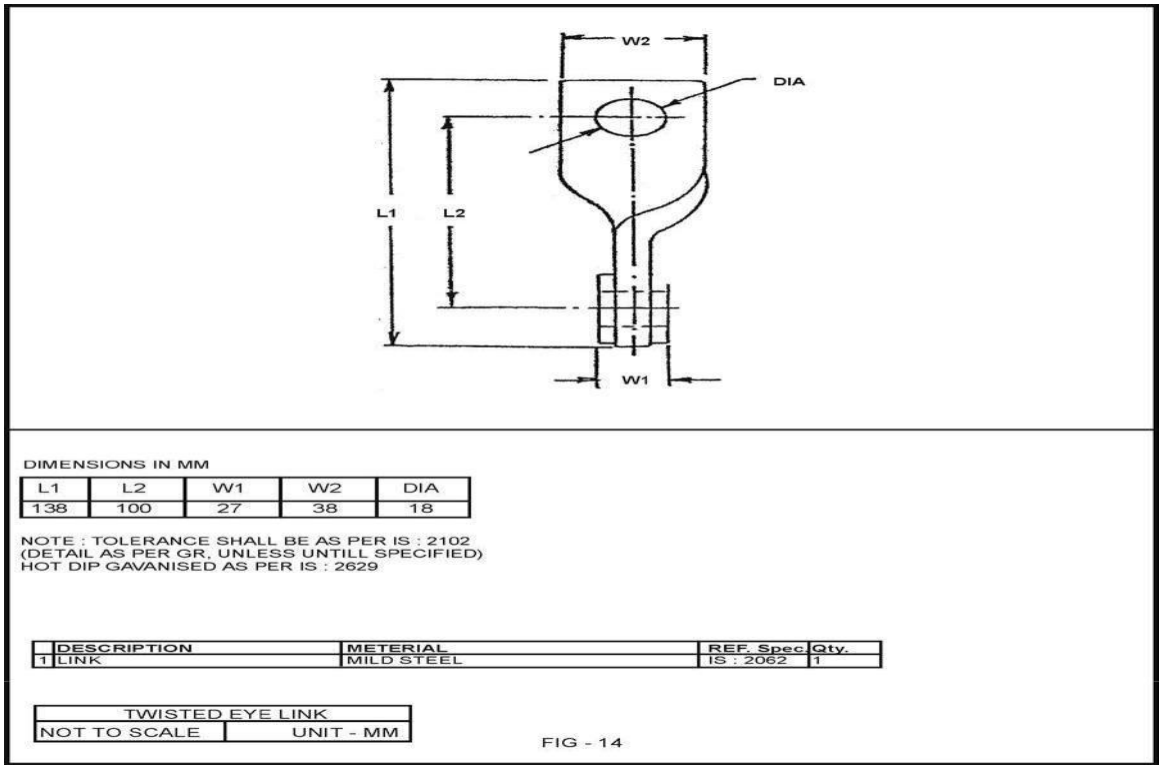


FIG - 2

6.2 TWISTED EYE LINK:

The twisted eye link is used for installing suspension fitting on stay clamp or on tension hook as shown in fig.

14.



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

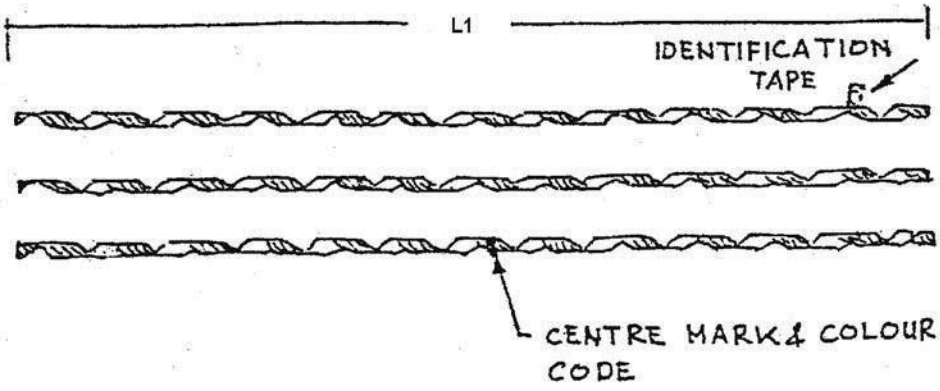
	DESCRIPTION	METERIAL	REF. Spec	Qty.
1	LINK	MILD STEEL	IS : 2062	1

TWISTED EYE LINK	
NOT TO SCALE	UNIT - MM

FIG - 14

6.2 PROTECTIVE HELIX (S)

Set of aluminium alloy helically formed protective helix having predetermined spiral shape is used & making them conveniently applied on the optical Fiber cable without excessive clamping pressure at any point. See 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 - 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)

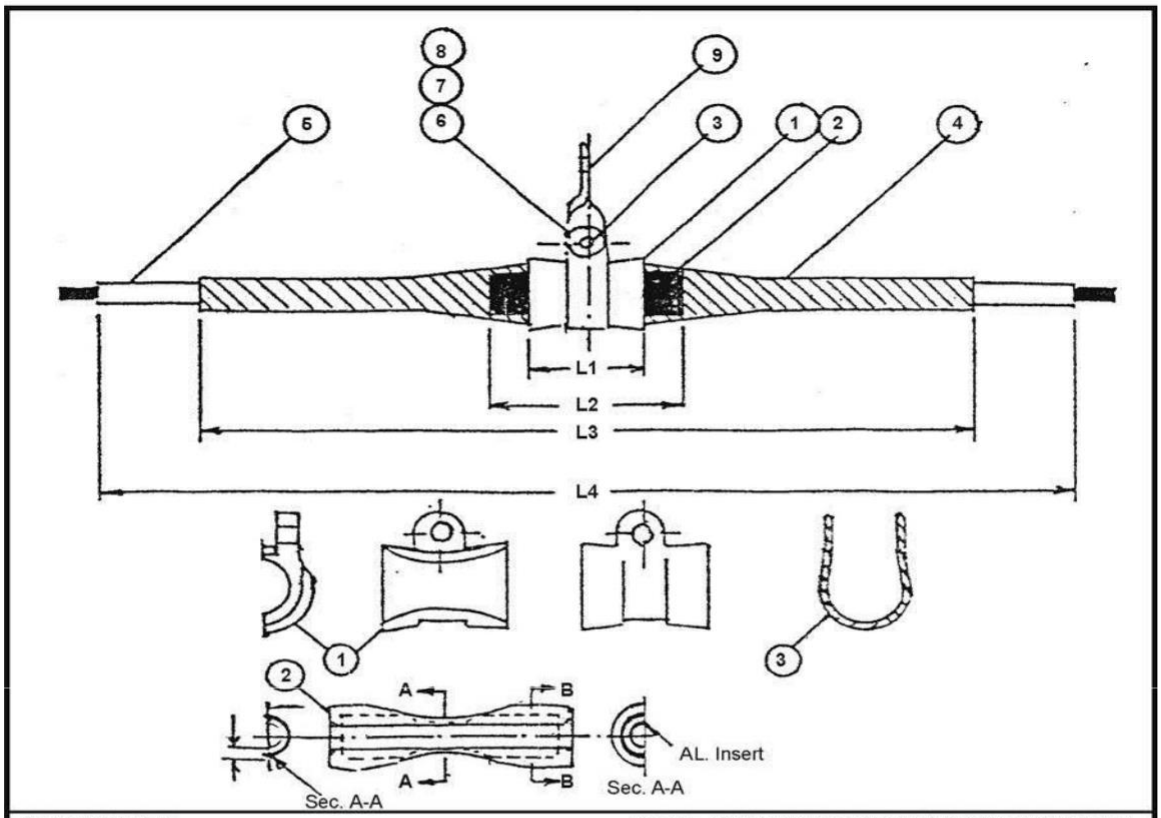
	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	PROTECTIVE HELIX	ALUMINIUM ALLOY 6061		

PROTECTIVE HELIX (S)	
NOT TO SCALE	UNIT - MM

FIG - 10

6.2 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, 3.



(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

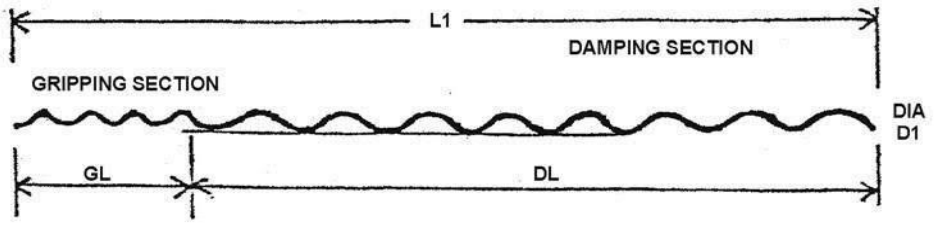
	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	CLAMP)	ALUMINIUM ALLOY GDC	1S : 617	1 SET
2	INSERTS) SUSPEN. CLIPPER	POLYCHLOROPRENE COMPOUDED	1 PAIR	1 PAIR
3	STRAP)	ALUMINIUM ALLOY	IS : 617	1
4	AGS HELIX	ALUMINIUM ALLOY 6061		1 SET
5	PROTECTIVE HELIX	ALUMINIUM ALLOY 6061		1 SET
6	RIVET M 16	MILD STEEL GAVLVANISED	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

6.2 SPIRAL VIBRATION DAMPER (SVD)

Helically formed spiral vibration dampers are used on both sides of suspension fittings as shown in fig. 13.



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)

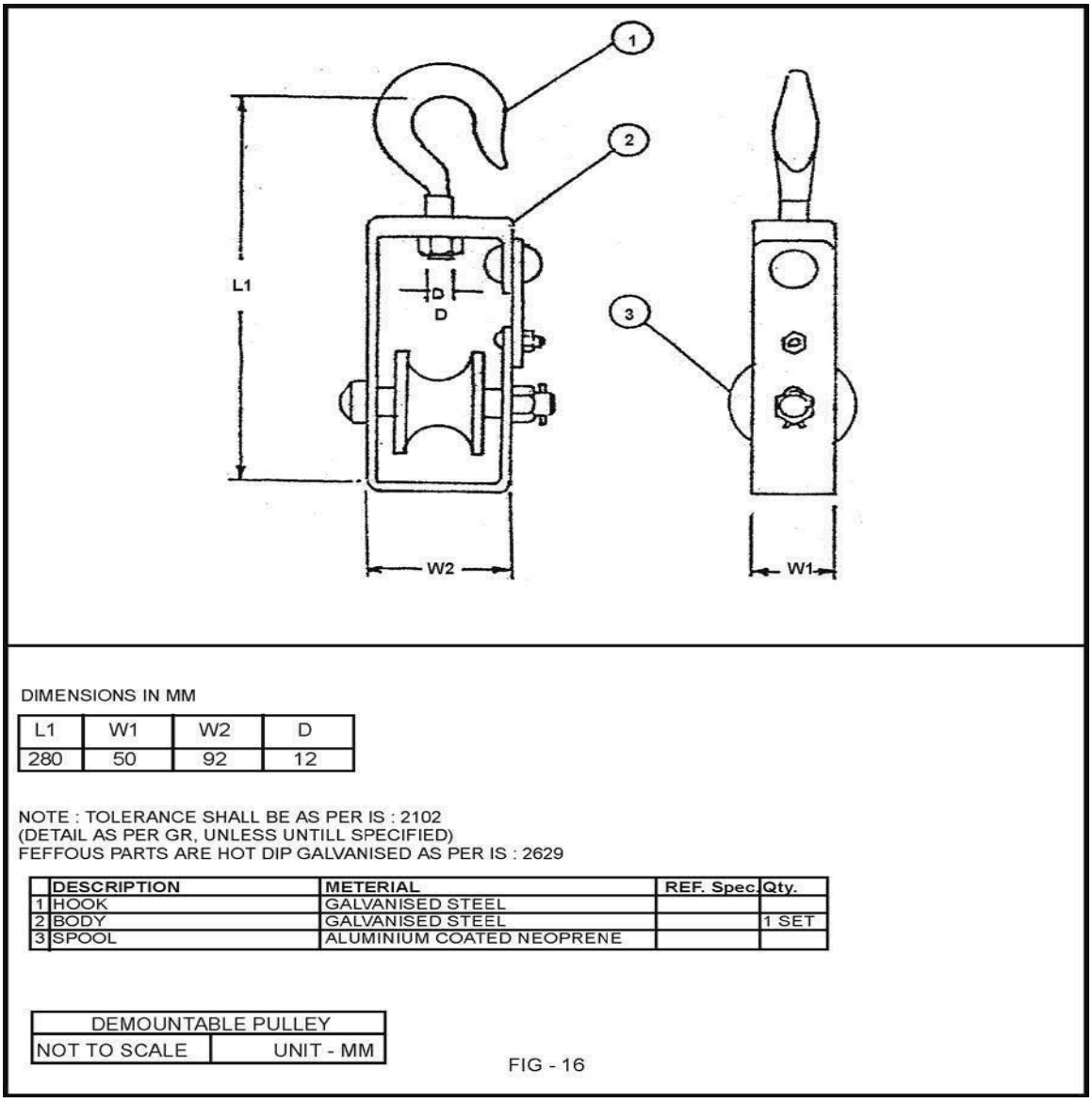
	DESCRIPTION	METERIAL	REF. Spec.	Qty.
1	SPIRAL VISRATION DAMPER	POLYVINYL COKPOUNDED		

SPIRAL VIBRATION DEMPER	
NOT TO SCALE	UNIT - MM

FIG - 13

6.2 DEMOUNTABLE PULLEY:

Demountable pulleys are used during the installation of aerial optical Fiber 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.



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

12. Joint Enclosure and Splicing:

The ADSS cables would be required to be spliced at every joint, normally at a distance of every 2 kilometre. Splicing can be placed overhead or underground. The choice of placement of joint as overhead or underground buried would depend upon the field conditions & the decision of the executing agency based on the suitability as indicated below.

6.2 Overhead placement of joint:

6.2.1 The placement of joint overhead on the poles may be preferred choice of splicing in cases where power utilities are carrying out the work as most Power distribution companies may be more comfortable with aerial joint placement as compared to underground.

6.2.2 The overhead joints shall be placed with proper mounting arrangements on the poles..1 Proper tool/arrangement should be made available during maintenance for overhead joints.

6.3 Underground buried joint:

6.3.1 Underground buried joint is an established and field proven practice and is being used by BSNL since very long.

6.3.2 This would be safer and better suited methodology in cases where the workmanship of overhead joints may not be of desired quality and that chances of damage due to this may be higher.

6.3.3 During maintenance, the handling of underground joints would be easier as compared to Aerial placement of joints.

Features

- Standard fiber count 24 F
- Universal type i.e. suitable for all type of cable (ADSS OFC, Armoured and metal free cable)
- Provide scope for straight / branch joints
- Resistant to chemicals and corrosive atmosphere.
- Easy re-entry and closing with mechanical plastic clamp.
- Shall be water and air proof.
- Ribs on the body for extra strength
- 6 Cable entry port & 1 oval port
- Suitable for cable size upto-30mm
- Mounting Bracket for erecting on pole vertically straight.
- Dome type

Dimensions

- Length-395mm ±5%

· Outer diameter-273mm ±5%

13. MATERIAL REQUIREMENT OF INSTALLATION ACCESSORIES AND FIXTURES:

13.1 FOR DOUBLE TENSION POLES:

	DESCRIPTION	QUANTITY
1.	J-shaped tension hook	2
2.	(For C-bracket)	2
3.	Turn buckle	
4.	Extension link	2
5.	Clevis thimble	2
6.	Protective helix (T)	2 sets
	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)2 (Pole without C-bracket)

a)	Pole mounted stay clamp (Rail)	1 (Pole having C-bracket)
b)	Pole mounted stay clamp (Rail)	2 (pole having C-bracket)

OR

13.2 FOR SUSPENSION (INTERMEDIATE POLES)

	DESCRIPTION	**QUANTITY**
	1) a) Pole mounted stay clamp (Tubular)	
	b) Pole mounted stay clamp (Tubular)	OR
a)	Pole mounted stay clamp (Rail)	
b)		
	Pole mounted stay clamp (Rail)	

2) Twisted eye link

3) Suspension clamp consisting of the following:

i)Protective Helix (S)	1 set
ii)Armour grip helix	1 set
iii)Suspension clipper with	1 set
Elastomer pad etc.	2
iv) Spiral vibration damper	
v) J-shaped tension hook	1 (Pole with C-bracket)
4) Demountable pulley	One per pole in the splice section

14. ENTRY OF THE O.F. CABLE IN THE BUILDING:

Normal methods for leading in and precautions recommended for leading-in of the optical Fiber 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 overhead pole to inside of the building for termination.

15. PREPARATION:

15.1 Before the installation the O.F. cable should be tested.
15.2 As per requirement install the additional new poles.
15.3 Each pole should be checked for its strength. Provide extra stays if more strength is required.
15.4 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.
15.5 Replace weak and other poles for clear ground clearance and strength as per the field conditions.
15.6 Provide ground clearance of 12 feet in non-obstructing areas.
15.7 Raise the height to minimum 16 feet at all the road crossings.
15.8 Maintain the alignment as straight as possible.

15.9 Construct splice chambers.

16. SPLICE LOCATIONS:

For the cases, where field splices are to be buried underground, the cable should be brought down through a 40mm diameter 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.

17. CALCULATION OF SECTION LENGTH:

Aerial O.F. cable is supplied as per TEC GR in a length of 2 Kms $\pm$ 10%.
To arrive at the section length and allocating a particular reel of the cable to a particular section following consideration are required.

SECTION LENGTH:

1) Actual section length measured.

2) Allowance for sag 2% for each span length.

3) Cable at each through tension pole (4 meters).

4) Drop length.

5) Extra spare cable for coiling at the splice location (10 meters).

18. 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
Manila rope 12 mm diameter	:	etc.
		250 meters
6. Cable pulling winch machine	:	1
with tension monitoring device		
7. Anti-twist device	:	1
8. Cable pole fork	:	10
9. Flat twin open type cable grip	:	2

10. Communication link to connect feeding, pulling and intermediate points.

11. 40 mm 61 pipe, bends, bushes & clamps for fixing the pipe at the splice location.

12. First aid box.

19 INSTALLATION OF AERIAL

OPTICAL FIBER CABLE: The following steps

are recommended:

Install the accessories and fixtures as per the requirement of the individual poles it tension and suspension fittings.

Install the demountable pulley on all the poles in the section before pulling the cable.

Keep the cable drum over the jack near the 1st pole at the beginning of the section.

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.

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.

The cable should be pulled till the cable reaches the last pole of the section.

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.

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.

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.

Install the tension fittings and accessories at the 1st pole.

Fix a flat twin open type cable grip on the cable after tension pole for tensioning the cable in the preceding tension section.

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.

The cable should be lifted between two poles by using cable pole fork during tensioning and fixing of the cable.

During the fixing operation the cable shall remain under required tension for minimizing the sag in the splice section.

Now install tension fitting and accessories at the all tensioned pole at the end of the tension section.

Install the suspension fitting and accessories on the intermediate poles in the tensioned section.

Similarly installation should be carried out in each tension pole in the entire section and the tension ` and suspension fittings are installed.

At the Through tension poles the cable shall be kept loose and shall be supported by cable jumper clamp.
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 in case of underground splicing.

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.
Test the installed OF Cable.
Coil the OF Cable and keep it safe in the splice location for splicing.

20 PRECAUTIONS:

Provide display boards.

Provide sufficient number of road sign and traffic cones.

Avoid sharp bending of the OF cable during installation.

The OF cable should not be given extra tension than the permissible tension limits.

While crossing the overhead electric installations, safety measures should be taken. Also provide guard wire.

To avoid man made damages, safety measures should be taken for each pole.

21 REFERENCE:

- TEC GR on Planning Guidelines and the Installation Practices for the installation of self-supporting metal free Aerial Optical Fiber cable.

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
C-Bracket	reliability or serviceability of these lines.
D-Dia of cable,	: Degree Centigrade
degree C	
EI	
OF cable	: Engineering Instruction
SVD	: Optical Fiber Cable
TEC GR	: SPIRAL VIBRATION DAMPER
	: Generic Requirements issued by the Telecommunication Engineering Centre New Delhi.

22 ABBREVIATION:

23 GUIDELINE FOR INSTALLATION OF ADSS AERIAL OPTICAL FIBER CABLE

1) Scope

This document is intended to provide guidelines for selection of appropriate methodology for aerial installation of ADSS optical Fiber Cable on Existing Electrical Poles of 440/220/132/33/11 KV Lines and LT lines as per the route map and network design.

2) Installation Techniques

The techniques used in installation of Aerial ADSS Optical Fiber Cables are described here. With the proper installation hardware and skilled resource, any of these methods can be used to install ADSS cable. Many a times, it will become necessary to use a combination of these methods to achieve full installation.

Selection of the specific technique (i.e. Moving Drum method, Stationary Drum method or Manual Installation method), or a combination thereof, shall largely depend on the actual site conditions. The PIA shall select the most appropriate installation technique suitable to the site conditions.

3) Moving Drum method

In this method the cable is pulled directly from the cable drum mounted on a moving vehicle as it drives along the pole line. The cable drum must be mounted on a proper support to allow easy cable pay off. At the dead-end point, the cable is terminated using Termination Assembly sets and tensioned using turnbuckles to maintain cable sag within permissible value.

To start installation, park the vehicle with the cable drum approximately 15 - 20 meters away from the pole facing away from it down the pole line. The cable must pay off from top of the drum towards the rear of the vehicle.

Install the termination supports and temporary hooks on the poles at the starting point and subsequent poles. Pull off the necessary amount of slack, lift the dead-end to the top of the pole and mount on the termination assembly.

Once the cable is fixed at both ends with at the terminating assemblies, carry out tensioning. After the cable section is properly tensioned and secured at both ends lift the cable out of the hooks at each of the intermediate pole and support it with the suspension set assemblies.

4) Stationary Drum Method

In this method of aerial cable installation, the cable is pulled along the cable route through temporary support hardware. Stationery drum installation method requires installation of temporary support hardware such as pulley blocks.

A rope wound on the tension limiting winch is passed through the pulleys and connected to the cable on the drum installed on a stand which allows free rotation of the drum. The pulling load should normally not exceed 60% of the maximum permissible cable tension recommended by cable supplier.

The cable drum and winch locations must have vehicular access. The cable drum should always be placed on levelled ground so that its flanges are vertical thus avoiding rubbing of cable against flanges. The orientation should be such that the cable pay-off is directly in the direction of pull. Always pay-out the cable from top of the drum and not from

bottom. The drum should have provision to allow controlled pay-out of cable. Cable pay-out needs to be controlled to prevent free running or jerking.

Once the cable is completely pulled end to end, it is then ready for installation of permanent supporting system of terminating and suspension set assemblies at required locations and tensioning for sag control.

5) **Manual Installation method**

Manual installation method technique is similar to stationary drum method, except that in this case the cable is uncoiled from the drum and placed on the ground in the shape of 8.

The pulling operation is same as in stationary drum method. The hardware requirement and pulling equipment also remains same.

For pulling in both directions, two loops of shape of 8 can be made and each can be pulled in separate directions.

Loops of size 4 to 5m x 1.5m should be sufficient in most cases.

6) Installation of Accessories

6.1Pole Clamp

Prior to fixing any temporary supports / stringing blocks or permanent cable suspension / termination assemblies, it is necessary to fix pole clamps. Appropriate type of pole clamps will be required depending on the shape of the pole. The two halves shall be opened and fixed at the specified height using tightening bolts.

6.2 Terminating (or dead End) Assembly

Termination assemblies are required at dead ends locations where:

i. Cable needs to be terminated at the end facility

ii. loops are to be kept for future maintenance activities

iii. For double sided termination assembly 2 sets would be required.

iv. To fix a termination Assembly following accessories are required:
v. Protective Helix on the cable,
vi. Terminating Helix with a thimble,
vii. Clevis Thimble,
viii. Spiral Vibration Damper

6.3 Suspension Assembly

ADSS optical Fiber cable shall be supported on all intermediate poles between two terminating poles using the pole clamp and a suspension assembly set.

To fix a suspension Assembly following accessories are required:

Protective Helix on the cable,

Suspension Helix,

Clevis Thimble,

Spiral Vibration Dampers

6.4 Installation Cable Loop / storage / Joint Closure

Cable loops are to be provided for future maintenance purposes at regular spacing. A fixture is required to be installed. Excess cable is then wound & kept on support. The fixture provides a means to ensure Proper bend radius is maintained. Separate clamp is required for installation of Joint Closures.

6.5 Supporting Jumper Cable Clamp

Jumper cable hanging between a pair of Termination Assemblies installed at locations where there is sharp change in direction need to be supported with a special twisted link. To support jumper cable, use already installed clamp.

6.6 Cable Tensioning

After the required Length of cable has been placed, the cable shall be properly tensioned before it is permanently secured into suspension assemblies.

The temporary dead end should be installed 4 to 5 m from the pole so that after complete tension is applied, appropriate permanent termination assembly set can be installed while the cable is in tension. The chain hoist will also need to be tied to the pole directly using a sling and on to pole clamp.
Once the cable sanction are under the required tension and the sag is within limits (i.e. less than 1% of span), the “free” end of the cable used for tensioning is fitted with termination assembly set and terminated. Once the load is transferred on to permanent termination end, the temporary arrangement shall be removed.

6.7 Machinery / Equipment / Tools

i. Ropes and Light weight ladder for installation of termination / suspension assemblies, clamps etc. ii. Temporary supports, dynamometer, chain hoists, temporary dead ends steel cables, etc. required during cable laying and / or cable pulling and cable preparation kits, etc. as applicable will have to be arranged by the PIA. iii. Van with portable splicing machines and OTDR, power meter, cable preparation kits, etc. for splicing and testing of installed ADSS Optical Fiber Cable.

iv. Other tools and tackles shall include wrenches, spanners, screwdrivers, hummer, ropes etc.

v. All safety equipment such as safety belts, insulating and cotton gloves and hard hats, fluorescent vests etc. as required.

Annexure-IV

Payment Schedule

The procedure for payment of bills is enumerated as under which shall however be done on receipt of respective payments from the end customer.:

Payments shall be released only on satisfactory acceptance of the deliverables for each Task as per the following schedule:

Sl No	**Activity/Task (A)**	**Payment Milestone against services(B)**	**Documentary Evidence('C)**
1	End-to-End connectivity of 30% of total GPs	20% of the Work Order Value towards services. (SD @7.5% will be deducted from running bill)	**Services:** Installation, Commissioning and testing report verified &recommended by TPA and approved by State Head BBNLOTDR link test reports, power on, post, FINAL AT report and certificate issued along with configuration reports verified &recommended by TPA and approved by State Head BBNL, As Build Diagram (ABD report),GIS update in BBNL Portal, Monthly Progress Report
	End-to-End connectivity of 60% of total GPs	30% of the Work Order Value towards Services. (SD @7.5% will be deducted from running bill)	**Services:** Installation, Commissioning and testing report verified &recommended by TPA and approved by State Head BBNLOTDR link test reports, power on, post, FINAL AT report and certificate issued along with configuration reports verified &recommended by TPA and approved by State Head BBNL, As Build Diagram (ABD report), GIS update in BBNL Portal Monthly Progress Report
	End-to-End connectivity of 100% of total GPs	50% of the Work Order Value towards services (SD @7.5% will be deducted from running bill)	**Services:** Installation, Commissioning and testing report verified &recommended by TPA and approved by State Head BBNLOTDR link test reports, power on, post, FINAL AT report and certificate issued along with configuration reports verified &recommended by TPA and approved by State Head BBNL, As Build Diagram (ABD report), GIS update in BBNL Portal ,Monthly Progress Report
	1 year after Go-Live of the Project	Release of SD @7.5% deducted from running bill after defect liability period and one year from Go-Live whichever is later.	Report duly verified and certified by TPA and approved by State Head.

Note 1: All payments shall be released after certification of Delivery and Implementation Milestones by BBNL/BBNL Appointed TPA.

Note 2: All Payments shall be made in Indian Rupees Only and shall be subject to provisions of Clauses 30.

Note:3: Payment shall be released by the purchaser against the invoices raised by PIA within 30 calendar days on providing all the relevant documents timely and are complete in all reference or payment received from the Customer whichever is later.

Note:4: All payments shall be made through RTGS only.

Note:5: Payments should be subject to deductions of any amount for which the PIA is liable under the NIT conditions. Further, all payments shall be made subject to deduction of TDS (Tax deduction at Source) as per the current Income-Tax Act/GST.

17. Stipulated Time Schedule and Penalties:

17.1 The key milestone dates ("critical dates") * as anticipated by the Purchaser are:

S. No.	Deliverable	Timeline for completion	Penalties*	Incentives	Remarks
1.	Issuance of Award of Contract (work order)	T0	N.A.	-	On selection of the PIA, Award of Contract (Work Order) is issued
2.	Site Survey* (To be carried out simultaneously with OFC laying where survey is completed)	T0+15 Days for Site Survey	N.A	-	Submission of survey report, **Monthly Progress report** **Note:** Based on approved site survey, bidder shall provide block-wise detailed Bill of Quantity (BoQ) and total cost of Project (*block wise and progressive BoQ / Project Cost excluding O&M cost*)
3.	End-to-End connectivity of GPs	1st Month from the date of issuance of Award of Contract (work order)	If the bidder fails to complete 30% of total GPs within stipulated time schedule then a penalty of 10% of total cost of incomplete GPs shall be deducted	-	Copy of Duly Signed and Stamped Delivery Challan, Installation, Commissioning of the network and testing report verified and recommended by TPA and approved by State Head BBNL, OTDR link test reports, power on, post, FINAL AT report
4.	End-to-End connectivity of	2nd Month from date of issuance	If the bidder fails	-	Copy of Duly Signed and

	GPs	of Award of Contract (work order)	to complete 60% of total GPs within stipulated time schedule then a penalty of 10% of total of incomplete GPs shall be deducted		Stamped Delivery Challan, Installation, Commissioning of the network and testing report verified and recommended by TPA and approved by State Head BBNL, OTDR link test reports, power on, post, FINAL AT report and certificate issued along with configuration reports verified and recommended by TPA and approved by State Head BBNL, As Build Diagram (ABD report), Monthly Progress Report.
5.	End-to-End connectivity of GPs	3rd Month from date of issuance of Award of Contract (work order)	If the bidder fails to complete 100% of total GPs within stipulated time schedule then a penalty of 10% of total cost of of incomplete GPs shall be deducted	If the bidder completes additional no. of GPs as given in milestone within the stipulated time schedule then an incentive of 3% of total cost of Project (excluding O&M cost) of additional completed GPs shall be given to the bidder	Copy of Duly Signed and Stamped Delivery Challan, Installation, Commissioning of the network and testing report verified and recommended by TPA and approved by State Head BBNL, OTDR link test reports, power on, post, FINAL AT report and certificate issued

					along with configuration reports verified and recommended by TPA and approved by State Head BBNL, As Build Diagram (ABD report), Monthly Progress Report.

NOTE: If the PIA earns incentive against any milestone, the deliverables target against next milestone will be arrived at excluding the numbers of GPs for which incentive was earned.

*PIA shall start end to end connectivity of GPs in those blocks for which the site survey has been conducted and approved by BBNL. Meanwhile the PIA shall also continue to do the site survey for the remaining GPs. Hence, the site survey and commissioning of network at GPs shall go simultaneously. For example: PIA can submit the survey report of 3 blocks for the approval by BBNL and can start implementing the required work and can continue the site survey for other sites and start delivery & implementation of the approved sites. But the survey of whole package should be completed within 15 days.

18. Liquidated Damages

18.1 The PIA shall perform the Services and comply in all respects with the critical dates and the parties hereby agree that failure on part of the PIA to meet the critical dates without prejudice to any other rights that the Purchaser have, may lead to the imposition of such obligations as are laid down in the Delay and Deterrent Mechanism and/or levy of penalty as set and/or termination of the Contract at the discretion of the Purchaser.

18.2 Penalties shall be capped to maximum of 15% of total cost of Project Value. Beyond 15% the Purchaser has the right to terminate the contract or a portion or part of the work thereof. The purchaser shall give 30 days' notice to the PIA of its intention to terminate the Contract and shall so terminate the Contract unless the Bidder initiates remedial action acceptable to the Purchaser during the 30 days' notice period,

18.3 The Purchaser may without prejudice to its right to effect recovery by any other method, deduct the amount of liquidated damages from any money belonging to the PIA in its hands (which includes the Purchaser's right to claim such amount against PIA s' Bank Guarantee) or which may become due to the PIA. Any such recovery or liquidated damages shall not in any way relieve the PIA from any of its obligations to complete the Works or from any other obligations and liabilities under the Contract.

ANNEXURE-VI

ANNEXURE B (2) - PENALTY FOR DEVIATION FROM STANDARD ENGINEERING INSTRUCTIONS

UNDERGROUND LAYING

Normally depth of the trench should 1.65 m in normal & mix soil and 1.2m in hard soil. Deviations due to field conditions will be required to have necessary protections in case of less depth. The cases and solutions are as following;

1. Minimum depth of burial in general shall be 1.65m
2. In rocky area (including Murrum& soil mixed with stone or soft rock) depth of burial shall be 1.2m at the minimum.
3. In case of utility where depth is 90 to 120 cm then DWC protection is to be used in normal/mix soil case.
4. In some areas where the depth is 60cm, in those cases reinforced concrete casing of 4"(Four inch) round should be provided.
5. For hard strata/rock soil layer for 60 to 90 cm cases DWC with wire mess and PCC is to be used. However, for depth relaxation photograph (with GPS) proof and justification is required.

6. 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. The relaxation by the competent authority prescribed below shall be obtained giving reasons for not achieving standard depth;

Size/Type of Cable	**Standard Depth cms.**	**Minimum acceptable Depth without Relaxation**	**Powers delegated for Relaxation, For depth upto**	
			BBNL Officer - 1 (PMU)	**Designated BBNL Officer -2 (State Head)**
OFC	165	90%	80%	30% As per latest EI and latest instructions with protection

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;

Depth between	Reduction in rates
cm. to > 150cm.	**5% of approved rates**
cm. to > 130cm.	**12.5% of approved rates**
cm. to > 100cm.	**25% of approved rates**
Bellow)100 cm.	**40% of approved rates**

Note: In case of depth below 1.2m, instructions as per latest EI and instructions for protection etc. will be followed.

Assuming that the standard depth required is 165 cm and the rate approved is Rs.100/- for the standard depth, then as per the above formula, for a depth of 100 cm the rate worked out is

Rate Applicable = 100X0.75 = Rs.75/- per running meter

Actual amount to be paid = (100/165) X75 = Rs.45.455/-

= Rs.45.5/- per running meter

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 in EI (as per Annexure B) and the payment will be not processed until the proper rectification has been completed.

ANNEXURE-VII

REF NO.

BANK GUARANTEE PROFORMA

1. As agreed under the relevant terms and conditions of Purchase Order Ref _____ dt _____ (hereinafter called the said Purchase Order) between M/s. ITI Ltd., NS Unit, Dooravani Nagar, Bangalore-560 016, India. (Hereinafter called the purchaser) and M/s. _____ (hereinafter called the supplier) for supply of _____, the supplier hereby agrees to furnish a security Deposit against supply performance by way of an irrevocable Bank Guarantee for Rs. _____ (Rupees. _____). We _____ (indicate the name of Bank) (hereinafter referred to as 'THE BANK' at the request of the supplier do hereby undertake to pay to the purchaser, an amount not exceeding Rs. _____ (Rupees. _____ _____) against any loss or damage caused to or suffered or would be caused to or suffered by the Purchaser, by reasons or breach by the said supplier of any of the terms or conditions contained in the said Purchase Order.

2. We _____ (indicate the name of the Bank) do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the purchaser stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the purchaser, by reason of breach by the said supplier of any of the terms and conditions contained in the said Purchase Order or by reason of the supplier's failure to perform the said Purchase Order. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees. _____).

3. The Bank further agrees that the Purchaser shall be the sole judge as to whether the said Supplier has committed any breach or breaches of any of the terms and conditions of the contract and the extent of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the Purchaser on account thereof, and the decision of the Purchaser that the said Supplier has committed such breach or breaches and as to the amount or amounts of loss, damage costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the Purchaser from time to time shall be conclusive, final and binding on the Bank.

4. We undertake to pay to the Purchaser, any money so demanded notwithstanding any dispute or disputes raised by the Supplier in any suit or proceedings pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

5. It shall not be necessary for the Purchaser to proceed against the Supplier before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the Purchaser may have obtained or obtains from the Supplier.

6. We _____ (indicate the name of Bank) further agree with the Purchaser, that the Purchaser shall have the fullest liberty without our consent and without effecting in any manner our obligation hereunder to vary any of the terms and conditions of the said Purchase Order or to extend time of performance by the said Supplier from time to time or to postpone for any time of from to time any of the powers exercisable by the Purchaser against the said Supplier and to forbear or enforce any of the terms and conditions relating to the said Purchase Order and we shall not relieved from our liability by reasons of any such variation, or extension being granted to said Supplier or for any forbearance, act or omission on the part of the Purchaser or any indulgence by the Purchaser, to the said Supplier 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.

7. This Guarantee will not be discharged due to the change in the constitution of the Bank or the Supplier.

8. We _____ (indicate the name of Bank) undertake not to revoke this Guarantee during its currency except with the previous written consent of the Purchaser, in writing.

9. Notwithstanding anything contained in the foregoing clauses, our liability under this guarantee is restricted to Rs. _____(Rupees. _____) and our guarantee shall remain in force until _____ (Date of expiry of warranty period). Unless a demand is made against us to enforce a claim under this guarantee within three months from the date of expiry of warranty period, all your rights under this guarantee shall be forfeited and we shall be relieved and discharged from all liability hereunder.

DATE: For _____ (indicate the name of Bank)
PLACE:

ANNEXURE-VIII

FINANCIAL/COMMERCIAL BID

SCHEDULE OF ACTIVITIES FOR LAYING OF OFC AND I&C OF GPON EQUIPMENT IN VARIOUS ZONE OF BBNL	
SL.NO.	**BRIEF DESCRIPTION OF WORKS**
1	**WORK CONSIST OF PHYSICAL SURVEY OF ALL GP'S FOR FEASIBILITY OF ROUTE AND STRATA INCLUDING OLT/ONT SITE SURVEY, TRENCHING,HDPE DUCT LAYING, CABLE BLOWING,SPLICING, JOINTING , BACK FILLILNG, TERMINATION FIXING ROUTE AND JOINT INDICATORS, JOINT CHAMBERS GETTING ROW PERMISSION RESPONSIBILLITY ETC., AND OTHER ALLIED WORKS CONNECTING TO END TO END TERMINATION AS PER SPECIFICATION AND CONDITIONS IN NIT. The Brief of works consists of the following:**
a	Physical survey of all GPs for Feasibility of route and strata including OLT/ONT sites survey
b	Excavation of trench for HDPE-PLB pipe laying , Backfilling, Reinstatement and Compaction after laying of HDPE-PLB pipe.
c	Earth work excavation in all kinds of soil Hard soil and Hard rock.
d	Trench excavation is 165 cm deep below ground level, 0.3 m wide at bottom and 0/45 m at top and back filling with excavated soft soil for HDPE pie laid at specified depth below ground level and compaction complete
e	Horizontal directional drilling-Drilling with mechanized means of bore dia upto 175 mm irrespective of soil at Road crossings/Canal crossings/railway crossings etc including supply and laying of 50 mm dia medium class GI pipe complete
f	GI Pipe 50 mm NB including supply of pipes and clamps medium class and providing concreting 1:2:4 50 mm above pipe under road/railways crossings bridges culverts at depts as per specifications
g	Providing and laying and jointing with collars back filling compaction complete in city areas, dry culvert crossings at a depth of 100-165 cm a] R.C.C Hume pipe 150 mm dia
h	Laying, jointing and levelling of 40 mm OD pre lubricated HDPE pipe with accessories Excluding supply of HDPE pipe and accessories. Supply will be made to designated store at a specified depth in trench/G.I pipe/R.C.C pipes complete including D.I.T.
i	Brick chamber of size 2 x 2 x 1.8 mtrs depth, base of chamber provided with 1:5:10 concrete ofsize 1.7m x 1.7m x 0.15 mtrs of thickness. Wall of brick chamber should be constructed on this basing having wall thickness of 0.23m using cement mortor of mix 1:5. The internal diameter of of chamber is 1.2 x 1.2 x 1.0 mtrs. The bricks to be used for this construction should be 9" x 4.5" x 3".
j	Providing and fixing pre cast RCC route /Joint indicator of RCC 1:2:4 including 12 mm thick cement plaster in CM 1:3 , painting sign writing placed at 200 mtrs intervals and at all jointing place, road/Railway crossing etc complete as per drawing ----
k	Providing and laying and jointing with collars, back filling, compaction, complete in city areas, dry culver, crossings. RCC hume pipe of 150 mm dia
l	Providing & laying DWC pipes of normal duty confirming to TEC GR no. GR/DWC-34/01 sep.2007 for protection of Optical Fibre Cable
m	Laying / blowing of Optical Fibre Cable inside laid HDPE-PLE pipe
n	24 F Metal free OF Cable with double HDPE sheath (Loose tube type) 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 FTB and all the relevant accessories etc. and end to end testing of dark and lit fibre per GP (For underground lying) (As per the Engineering Instruction issued by BBNL)
o	Splicing and Jointing of Optical Fiber Cable including Acceptance testing, commissioning and make over of the routes.
p	Road/ Bridge crossing, laying of HDPE-PLB inside DWC pipe, wherever required and obtaining Right of way (ROW) Permissions. **As per the detailed mentioned in the special conditions of contract.**
q	The rate to be quoted for per Km length of trenching including HDD, Bridge, Culvert, Railway, Highway, Canal crossing for Duct Laying in case of Underground Cable laying.
2	GPON EQUIPMENT INSTALLATION, COMMISSIONING AND AT at FOLLOWING LOCATIONS

(a)	OLT AT BSNL EXCHANGE ALONG WITH FDMS AND ACCESSORIES AND CABLE PATCH CORD
(b)	ONT AT GP WITH ACCESSORIES AND CABLE / PATCH CORD
3	**NOTE TO THE TENDERER:**
a	The above work should be done as per the Engineers instructions referred as in the Special Conditions of contract.
b	Tenderer should acknowledge that the digging, trenching, which is an important in OFC laying depends on the soil strata. The tenderer is expected to do a detailed site survey and assess the type and expenditure involved in cost of trenching as per the specifications in the tender. And also consider the uncertainties in his bid including on account of difficult terrain, hard soil, or rocky area, ROW permission related to challenges.
c	Tenderer shall procure adequate number of smart phone with GPS facilities for their stiff to update the project status through mobile applications.
d	Tenderer should have the separate dedicated team for getting and follow-up for ROW works
e	The following items shall be provided by ITI
i)	24F Metal free OF Cable with double HDPE sheath (Loose Tube type)
ii)	HDPE PLB Duct with Coupler and End-Cap
iii)	OLT
iv)	ONT
v)	FDMS
vi)	Splitter
vii)	Patch Cord
viii)	Joint Box for OFC
ix)	FTB
f	Materials listed above will be provided by ITI Ltd. and rest of the materials required for the execution of the work will be responsibility of bidder.
g	The tenderer has the responsibility of obtaining RoW permission. The Company will extend all cooperation to tenderer in obtaining RoW permission If the tenderer has to pay RoW charges to any agencies then ITI/BBNL will reimburse the same on submission of original receipt.
j	Quantity is only indicative and approximate. The exact quantity shall be obtained after the site survey by the tendered and same shall be got approved by ITI Ltd and BBNL in the beginning of the project.

Table A (Survey, Planning, Supply, Installation, end to end integration, testing and commissioning**) ***

The bidders are to provide acceptance for the price mentioned against all items of Passive Infrastructure, Active Infrastructure and Solar Panel as per the details given.

GST shall be extra, payable at the prescribed rate against the GST invoice.

S. No	Item Description as per Technical Specifications	Unit	Approx. Qty (A)	Rate (In Rs.) (B)	Total Cost (exclusive of Tax) (C)=A*B
	Passive infrastructure:				
1	Excavation of trench for PLB pipe laying, PLB pipe laying, Back filling, 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 with GIS Mapping and Acceptance Testing, Commissioning and makeover of the routes. The work also includes road / bridge crossing, laying of PLB inside DWC pipe, wherever required and obtaining Right of-Way (RoW) permissions. Commissioning of 24 core optical fibre connectivity from the Block PoP to GP room and termination at GP ONT. The cost shall include fixing of joint chamber, manhole, splice closure, Fixing, painting and sign writing of Route /Joint Indicators, termination at FTB 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). Commissioning of 24 core optical fibre connectivity from the Block PoP to GP room and termination at GP ONT. The cost shall include laying, fittings, splicing, splitting, splice closure, termination at FTB / FDMS & all the relevant accessories etc. and end to end testing of dark and lit fibre per GP. The rate includes supply of Jointing Chambers, Route Marker, Main Hole Marker, GI/DWC pipes, RCC poles, Power cables for connecting OLTs/ONTs, OTDRs, Smart Phones for ABD data capture and upload to NOC, laptops for OLT/ONT commissioning and any other items required for completing the work and commissioning the network. ***As per Scope of work in Chapter-3, Special Technical conditions, Construction Specification and* Engineering Practices.** **The rate to be quoted for per Km length of trenching including HDD, Bridge, Culvert, Railway, Highway, Canal crossing for Duct Laying.**	Km	130	269325	35012250
	Active infrastructure:				
2	Installation and commissioning of Electronics at Block (OLT) and integration with Existing EMS or New EMS	Nos	4	6982.50	27930
3	Installation and commissioning of ONT &Associated equipment and integration with BBNL NOC	Nos	30	5985	179550
	Solar Panel (Power) (As per technical Specifications given in Annexure-ATEC GR No.) Material and Services:				
4	Installation, integration and commissioning of Solar Photovoltaic Power Supply including Solar Power Panel, VRLA Batteries, Charge Controller Unit (along with the suitable stand ,Earthing and installation materials)	Nos	30	9975	299250
	Approximate Total Bid Value of work (Excluding GST) In Rs.				**35518980**

ANNEXURE– IX

PRE CONTRACT INTEGRITY PACT

PURCHASE ENQUIRY/ORDER No.

THIS Integrity Pact is made on……day of …….20.

BETWEEN:

ITI Limited having its Registered & Corporate Office at ITI Bhavan, Dooravaninagar, Bangalore – 560 016 and established under the Ministry of Communications, Government of India (hereinafter called the Principal), which term shall unless excluded by or is repugnant to the context, be deemed to include its Chairman & Managing Director, Directors, Officers or any of them specified by the Chairman & Managing Director in this behalf and shall also include its successors and assigns) ON THE ONE PART

AND:

…….. represented by……...Chief Executive Officer (hereinafter called the Contractor(s), which term shall unless excluded by or is repugnant to the context be deemed to include its heirs, representatives, successors and assigns of the bidder/contract ON THE SECOND PART.

Preamble

WHEREAS the Principal intends to award, under laid down organizational procedures, contract for ……. of ITI Limited (name of the Stores/equipment's/items). The Principal, values full compliance with all relevant laws of the land, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal has appointed an Independent External Monitor(IEM), who will **monitor** the tender process and the execution of the contract for compliance with the principles as mentioned herein this agreement.

WHEREAS, to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact the terms and conditions of which shall also be read as integral part and parcel of the Tender Documents and contract between the parties.

NOW THEREFORE, IN CONSIDERATION OF MUTUAL COVENANTS STIPULATED IN THIS PACT THE PARTIES HEREBY AGREE AS FOLLOWS AND THIS PACT WITHNESSETH AS UNDER:

SECTION 1 – COMMITMENTS OF THE PRINCIPAL

1.1 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 the contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the personal 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.

1.2 If the Principal obtains information on the conduct of any of its employee, which is a criminal offence under IPC/PC Actor if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary action as per its internal laid down Rules/ Regulations.

SECTION 2 – COMMITMENTS OF THE BIDDER/CONTRACTOR

2.1 The Bidder(s)/Contractor(s)commits himself to take all measures necessary to prevent corruption. He commits himself observe the following principles during the participation in the tender process and during the execution of the contract.

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 other 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 bidders/contractors 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 IPC/PC Act, further the bidder(s)/contractor(s) will not use improperly, for purposes of competition of personal gain, or pass onto 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.

d. The Bidder(s)/Contractor(s) of foreign original shall disclose the name and address of the agents/representatives in India, if any. Similarly, the Bidder(s)/Contractor(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 the bid, disclose any and all payments made, are committed to or intend to make to agents, brokers or any other intermediaries in connection with the award of the contract.

f. The Bidder(s)/Contractor(s) will not bring any outside influence and Govt bodies directly or indirectly on the bidding process in furtherance to his bid.

g. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or to be an accessory to such offences.

SECTION 3 – DISQUALIFICATION FROM TENDER PROCESS & EXCLUSION FROM FUTURE CONTRACTS

3.1 If the Bidder(s)/Contractor(s), during tender process or before the award of the contract or during execution has committed a transgression in 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 Bidder(s)/ Contractor(s) from the tender process.

3.2 If the Bidder(s)/Contractor(s), has committed a transgression through a violation of Section 2 of the above, such as to put his reliability or credibility into question, the Principal shall be entitled exclude including blacklisting for future tender/contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal taking into consideration the full facts and circumstances of each case, particularly taking into account the number of transgression, the position of the transgressor within the company hierarchy of the Bidder(s)/Contractor(s) and the amount of the damage. The exclusion will be imposed for a period of minimum one year.

3.3 The Bidder(s)/Contractor(s)with its free consent and without any influence agrees and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground including the lack of any hearing before the decision to resort to such exclusion is taken. The undertaking is given freely and after obtaining independent legal advice.

3.4 A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that on the basis of facts available there are no material doubts.

3.5 The decision of the Principal to the effect that breach of the provisions of this Integrity Pact has been committed by the Bidder(s)/ Contractor(s) shall be final and binding on the Bidder(s)/

Contractor(s), however the Bidder(s)/ Contractor(s) can approach IEM(s) appointed for the purpose of this Pact.

3.6 On occurrence of any sanctions/ disqualifications etc. arising out from violation of integrity pact Bidder(s)/ Contractor(s) shall not entitled for any compensation on this account.

3.7 subject to full satisfaction of the Principal, the exclusion of the Bidder(s)/ Contractor(s) could be revoked by the Principal if the Bidder(s)/ Contractor(s) can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption preventative system in his organization.

SECTION 4 – PREVIOUS TRANSGRESSION

4.1 The Bidder(s)/ Contractor(s) declares that no previous transgression occurred in the last 3 years immediately before signing of this Integrity Pact with any other company in any country conforming to the anti-corruption/ transparency International (TI) approach or with any other Public Sector Enterprises/ Undertaking in India of any Government Department in India that could justify his exclusion from the tender process.

4.2 If the Bidder(s)/ Contractor(s) makes incorrect statement on this subject, he can be disqualified from the tender process or action for his exclusion can be taken as mentioned under Section-3 of the above for transgressions of Section-2 of the above and shall be liable for compensation for damages as per Section- 5 of this Pact.

SECTION 5 – COMPENSATION FOR DAMAGE

5.1 If the Principal has disqualified the Bidder(s)/Contractor(s) from the tender process prior to the award according to Section 3 the Principal is entitled to forfeit the Earnest Money Deposit/Bid Security/ or demand and recover the damages equitant to Earnest Money Deposit/Bid Security apart from any other legal that may have accrued to the Principal.

5.2 In addition to 5.1 above the Principal shall be entitled to take recourse to the relevant provision of the contract related to termination of Contract due to Contractor default. In such case, the Principal shall be entitled to forfeit the Performance Bank Guarantee of the Contractor or demand and recover liquidate and all damages as per the provisions of the contract agreement against termination.

SECTION 6 – EQUAL TREATMENT OF ALL BIDDERS/CONTRACTORS

6.1 The Principal will enter into Integrity Pact on all identical terms with all bidders and contractors for identical cases.

6.2 The Bidder(s)/Contractor(s) undertakes to get this Pact signed by its sub-contractor(s)/sub-vendor(s)/associate(s), if any, and to submit the same to the Principal along with the tender document/contract before signing the contract. The Bidder(s)/Contractor(s) shall be responsible

for any violation(s) of the provisions laid down in the Integrity Pact Agreement by any of its sub-contractors/sub-vendors/associates.

6.3 The Principal will disqualify from the tender process all bidders who do not sign this Integrity Pact or violate its provisions.

SECTION 7 – CRIMINAL CHARGES AGAINST VIOLATING BIDDER(S)/ CONTRACTOR(S)

7.1 If the Principal receives any information of conduct of a Bidder(s)/Contractor(s) or sub-contractor/sub-vendor/associates of the Bidder(s)/Contractor(s) which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer of the Principal for appropriate action.

SECTION 8 – INDEPENDENT EXTERNAL MONITOR(S)

8.1 The Principal appoints competent and credible Independent External Monitor(s) for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extend the parties comply with the obligations under this pact.

8.2 The Monitor is not subject to any instructions by the representatives of the parties and performs his functions neutrally and independently. He will report to the Chairman and Managing Director of the Principal.

8.3 The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all product documentation of the Principal including that provided by the Bidder(s)/Contractor(s). The Bidder(s)/Contractor(s) will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The Monitor is under contractual obligation to treat the information and documents Bidder(s)/Contractor(s) with confidentiality.

8 .4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the project provided such meeting could have an impact on the contractual relations between the Principal and the Bidder(s)/Contractor(s). 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 specific manner, refrain from action or tolerate action.

8.5 The Monitor will submit a written report to the Chairman & Managing Director of the Principal within a reasonable time from the date of reference or intimation to him by the principal and, should the occasion arise, submit proposals for correcting problematic situations.

8.6 If the Monitor has reported to the Chairman & Managing Director of the Principal a substantiated suspicion of an offence under relevant IPC/PC Act, and the Chairman & Managing

Director of the Principal has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

8.7 The word **'Monitor'** would include both singular and plural.

8.8 Details of the Independent External Monitor appointed by the Principal at present is furnished below: -

Shri Javeed Ahmad, IPS(Retd.)
M-1101, Shalimar Gallant Apartment,
Vigyanpuri ,Mahanagar,Lucknow-226006.

Any changes to the same as required / desired by statutory authorities is applicable.

SECTION 9 – FACILITATION OF INVESTIGATION

9.1 In case of any allegation of violation of any provisions of this Pact or payment of commission, the Principal or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Bidder(s)/Contractor(s) and the Bidder(s)/Contractor(s)shall provide necessary information and documents in English and shall extend all help to the Principal for the purpose of verification of the documents.

SECTION 10 – LAW AND JURISDICTION

10.1 The Pact is subject to the Law as applicable in Indian Territory. The place of performance and jurisdiction shall the seat of the Principal.

10.2 The actions stipulated in this Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

SECTION 11 – PACT DURATION

11.1 This Pact begins when both the parties have legally signed it. It expires after 12 months on completion of the warranty/guarantee period of the project / work awarded, to the fullest satisfaction of the Principal.

11.2 If the Bidder(s)/Contractor(s) is unsuccessful, the Pact will automatically become invalid after three months on evidence of failure on the part of the Bidder(s)/Contractor(s).

11.3 If any claim is lodged/made during the validity of the Pact, the same shall be binding and continue to be valid despite the lapse of the Pact unless it is discharged/determined by the Chairman and Managing Director of the Principal.

SECTION 12 – OTHER PROVISIONS

12.1 This pact is subject to Indian Law, place of performance and jurisdiction is the Registered & Corporate Office of the Principal at Bengaluru.

12.2 Changes and supplements as well as termination notices need to be made in writing by both the parties. Side agreements have not been made.

12.3 If the Bidder(s)/Contractor(s) or a partnership, the pact must be signed by all consortium members and partners.

12.4 Should one or several provisions of this pact turn out to be invalid, the remainder of this pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

12.3 Any disputes/ difference arising between the parties with regard to term of this Pact, any action taken by the Principal in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.

12. 4 The action stipulates in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of the witnesses:

For PRINCIPAL	For BIDDER(S)/CONTRACTOR(S)
……..	……
(Name & Designation)	(Name & Designation)
Witness	Witness
1) ……	1)……...
2) …….	2)…….....

ANNEXURE -X

Proforma of Agreement

An AGREEMENT made this day the ---------- Between …… ……..……... (hereinafter called the "BIDDERS") of the first part and M/s ITI LIMITED, …… ……..... (hereinafter called the "COMPANY") of the second part.

Whereas the Bidders have by tender dated----------offered to execute and fully complete the intended works in connection with the construction of …… ……for the company as set forth in the tender as amended and the drawings, general conditions, special conditions, specifications, bill of quantities and schedule hereto annexed according to the terms, obligations and conditions therein contained at and for an approximate total sum of Rs. …… (Rupees ……..…….…… ……. …….....……) and company has accepted such itemized rate tender in terms of its letter no …… Dated ……

Now this AGREEMENT witnesseth as follows:

1. The BIDDERS covenant and agree with the COMPANY that the BIDDERS will within the time of……. months from the date stipulated in the work order and in the manner and pursuant and subject to all and singular the terms, obligations and conditions in the said tender as amended and the drawings, general conditions, special conditions, specifications, bill of quantities and schedule provide, contained and referred to execute and fully complete all and singular the works specified, described or referred to in and by the said tender as amended and the drawings , general conditions, special conditions, specifications, bill of quantities and schedule and will well truly observe, perform, fulfill, submit to and keep all the said terms, obligations, conditions, and matters in the said tender as amended and drawings general conditions, special conditions, specifications, bill of quantities and schedule contained and referred to and on the part of the BIDDERS to be observed, performed, fulfilled, submitted to or kept according to the true intent and meaning of the said tender as amended and the drawings general conditions, special conditions, specifications, bill of quantities and schedule. Any items not covered by the tendered rates will be worked out as per special conditions attached to the tender documents.

2. In case the work is not completed in the manner mentioned above to the complete satisfaction of the COMPANY in every respect within the aforesaid time limit of …… Months from the stipulated in the work order, the BIDDERS agree to pay a penalty of……..% of the value of the work order for each week of delay beyond the date stipulated for the completion, subject, however to a maximum of …….% of the work order. It is agreed that time is the essence of the contract.

3. In consideration of the premises the COMPANY covenants with the BIDDERS that it will pay to the BIDDERS at the several times and in the sums, proportions and manner in the said, general conditions, special conditions in that behalf provided the amount accruing from time to time, but subject to Conditions therein contained.

4. This agreement further witnesseth that the BIDDERS hereby covenant with the COMPANY that in the event of the non-fulfillment in any respect by the BIDDERS of the said covenants, terms, agreements, obligations will pay to the COMPANY all loss, damages, costs, charges and expenses as the

COMPANY may be directly or indirectly put to in consequence of such non-fulfillment by the BIDDERS.

5. If the BIDDER fail to perform the contract or carry out the contract to the satisfaction of the COMPANY within the period fixed for the purpose or at any time repudiates the contract before the expiry of such period, the General Manager (Civil) or any officer of the COMPANY so authorized may, without prejudice to the right of the COMPANY to recover from the contactors damages for the breach of the contract, terminate the contract as the whole or terminate a part of the contract at the risk and cost of the BIDDERS without prior notice and get the balance work executed through some other agencies and held the BIDDERS liable for all the losses and expenses incurred by the COMPANY. The decision of the General Manager (Civil) is final with regard to the satisfactory performance of the Contract and is binding on both the parties.

6. In the event of any disputes arising in connection with this contract, it is further agreed that such disputes shall be referred to the sole arbitrator as per the arbitration clause in the general terms and conditions of the contract.

7. The following documents are deemed to form Part and parcel of the agreement viz., the tender dated ……and letter no …….. dated ……..the general terms and conditions, special conditions, the specifications, the priced bill of quantities, the schedule of rates and dated……..all of which for the purpose of identification have been signed by the……... ……..on the behalf of the COMPANY, and …….. on behalf of acceptance and all letters referred therein will also form a part of this agreement.

8. This agreement further witnesseth that the BIDDERS are responsible for any accident or other compensation payable to the workman employed by the working under the control of BIDDERS that the COMPANY has no sort of liability in the matter, and that if any payment would have to be made by the COMPANY, the same shall be reimbursed by the BIDDERS.

In witness where of the said parties here to have hereunto set their hands.

For, ITI LIMITED	For,
Authorised Signatory	PROPRIETOR

Witnesses:

1. ……
2. ……

Witnesses:

1. ……
2. ……

Place :
Date:

ANNEXURE-XI

DECLARATION OF TENDERERS

FROM……
…….

……
……

TO

……
…….

……
……

1. I/We……. have read the conditions of the tender and tender documents attached here to and agree to abide by such conditions. I/We offered to do ----------…… at the rates quoted in the attached schedule to complete the works on or before the dates mentioned in time schedule for completion of works.

2. I/We further agree to sign an agreement, bind to abide by the general conditions of contract and to carry out all works according to the specifications laid down in the tender papers. I/We hereby pay the earnest money of …….by demand draft/banker's cheque. I/We bind myself/ ourselves to deposit the security deposit as prescribed within 15 days after receiving the notice that the contract has been awarded to me / us failing which I/We have no objection to the forfeiture of the earnest money in full; otherwise the said earnest money shall be retained by the said company towards security deposit as specified in the conditions. I/We further bind myself /ourselves to execute the contract document and to commence the work with 15 days after issue of work order in writing as aforesaid failing I/We agree to the company forfeiting the earnest money and security deposit deposited with them. The accepting authority shall also be at liberty to cancel the acceptance of tender, if I/We fail to deposit the security amount as specified or to execute an agreement or to start work as stipulated in the tender documents.

3. I/We hereby enclose declaration of my/our experience of execution of works of similar nature and magnitude carried out by me/us in the prescribed proforma, and also the income tax and sales tax clearance certificates.

4. The offer shall remain open for acceptance by the Accepting Authority for a **period 3 months** from the date of opening of the tender.

Date:

Signature of tenderer
with seal of the firm

witness…….
(Name in block letters)

Power of attorney in case the tender is signed by the authorized nominee must be enclosed.
Address:
Occupation:

ANNEXURE-XII

Non-Disclosure Agreement

(Between M/s ……. & ITI Ltd)

This Agreement is made between: xxxxx, a Company incorporated under the Companies Act, 1956, having its Registered Office at ……, CIN No ……. (hereinafter referred to as "XXX" which shall include its successors and permitted assigns, herein after referred to as IP); and

ITI Limited, a Company incorporated under the Companies Act, 1956 having its Registered & Corporate Office at ITI Bhavan, Dooravaninagar Bangalore - 560016, INDIA, CIN No: L32202KA1950GOI000640 (hereinafter referred to as "ITI" which shall include its successors and permitted assigns). xxxxxxxxxxxxx and ITI are hereinafter also referred to individually as "Party" and collectively as "Parties". Background:

The Parties are evaluating and negotiating a potential contractual relationship, subject to mutually agreed definitive agreement, as per Tender No. ----------due on ……. issued by ITI Limited for "……" (the "Project").

(A) XXX may in these evaluations and negotiations disclose certain Confidential Information (as defined below) to Company;

(B) The Parties agree that the disclosure and use of Confidential Information is to be made on the terms of this Agreement.

The Parties agree as follows:

1 Definitions

In this Agreement, the following definitions apply:

"Affiliate" means, at the time of disclosure of any Confidential Information, any legal entity that directly or indirectly controls, is controlled by, or under common control with, a Party.

"Agreement" means this Non-Disclosure Agreement, as amended from time to time under Section 8.

"Confidential Information" means any information that is disclosed or made available in any form by XXX to Company, or that Company has gained knowledge from XXX as a result of this Agreement, but only if:

(a) such information is disclosed by XXX in writing, it is marked as confidential on disclosure;

(b) such information is disclosed by XXX orally, it is identified as confidential on disclosure;

(c) such information is disclosed in any other manner; it is designated in writing as confidential on disclosure; or

(d) the nature of such information otherwise makes it clear that it is confidential;

but excludes information that:

(e) is or becomes publicly available, except by an act or omission of Company,

(f) is demonstrably developed at any time by Company without use of such information, or

(g) is lawfully obtained at any time by Company from a third party without restrictions in its disclosure or use.

"Project" means the project defined under (A) in "Background".

"Purpose" means the evaluations and negotiations of a contractual relationship between the Parties for the Project.

2 Non-disclosure of Confidential Information

2.1 Subject to Section 4, Company must not disclose Confidential Information to any third party.

2.2 Company is liable for:

2.2.1 its loss or its unauthorized disclosure of Confidential Information, and

2.2.2 any loss or unauthorized disclosure of Confidential Information by any person that Company may disclose and has disclosed Confidential Information to under this Agreement.

2.3 But Company is not liable under Section 2.2 if both of the following conditions are fulfilled:

2.3.1 Company has used the same degree of care in safeguarding the Confidential Information as it uses for its own similar confidential information, but not less than a reasonable degree of care; and

2.3.2 Company notifies XXX immediately after it becomes aware of such inadvertent or unauthorized disclosure and takes reasonable measures to mitigate the effects of such disclosure and to prevent any further disclosure.

3 Use of Confidential Information

3.1 Company shall only use the Confidential Information for the Purpose.

3.2 The Confidential Information is provided “as is” without warranty of any kind and will remain the property of XXX.

3.3 Nothing in this Agreement assigns or transfers XXX’s intellectual property rights in any Confidential Information to Company.

4 Permitted Disclosure of Confidential Information

4.1 Company may only disclose Confidential Information to its employee, consultant or Affiliate if the disclosure is necessary for the Purpose.

4.2 Company may disclose Confidential Information to its Affiliate or consultant, and the Affiliate or the consultant is entitled to use the Confidential Information, but only if:

4.2.1 the Affiliate or consultant uses the Confidential Information to the same extent as Company may under this Agreement; and

4.2.2 Company undertakes that any Affiliate or consultant that receives Confidential Information will comply with this Agreement or with separate confidentiality obligations as restrictive as this Agreement.

4.3 Subject to 4.2, Company may disclose Confidential Information to any other third party, but only if:

4.3.1 XXX consents in writing before disclosure; and

4.3.2 Company undertakes that any such third party that receives Confidential Information will comply with this Agreement or confidentiality obligations as restrictive as this Agreement.

4.4 Company may disclose Confidential Information if:

4.4.1 such disclosure is in response to a valid order of a court or any other governmental body having jurisdiction over this Agreement, or

4.4.2 such disclosure is otherwise required by law or the rules of any stock exchange on which the shares or other securities of either party or its Affiliates are listed,

but only if (to the extent possible) Company has first given prior written notice to XXX and made reasonable efforts to protect the Confidential Information on such disclosure.

5 Copying and return of furnished instruments

5.1 Company may not copy any instruments furnished by XXX and containing Confidential Information, unless and to the extent necessary for the Purpose.

5.2 Any models, computer programs, documents and other instruments containing Confidential Information remain XXX's property. Company shall at its own cost return or destroy any such instruments or its copies at XXX's request.

6 Non-disclosure of negotiations

Subject to Section 4, neither Party may disclose to any third party the fact that the parties are evaluating and discussing the Project, without the other Party's consent. This undertaking survives the termination of this Agreement.

7 Term and termination

7.1 This Agreement comes into force on the day that both Parties duly sign it. But this Agreement applies to any Confidential Information that may have been disclosed before this time in connection with the Purpose.

7.2 This Agreement terminates Five (5) years after the date both Parties signed it or earlier, if it is superseded by stipulations of any future agreement between the Parties for the Project or if the Parties decide to end the Project. Notwithstanding the above, the rights and obligations set forth in this Agreement which have accrued prior to termination shall survive the termination or earlier expiration of this Agreement for a period of five (5) years.

8 Amendments

This Agreement may only be amended or modified by written agreement between the Parties.

9 Governing law and arbitration

10 ARBITRATION

10.1 The Parties shall make best efforts to settle any/all disputes amicably within 30 days of communications thereof.

10.2 All disputes or differences whatsoever, arising out of this NDA including the interpretation of any provisions shall be settled by arbitration in accordance with the provisions of Indian Arbitration and Conciliation Act, 1996. The Arbitration panel contains three Arbitrators, one to be appointed by the ITI and the other by XXX and the third Arbitrator shall be appointed by Arbitrators appointed as above. The decision of the Arbitrators will be binding on all the Parties to this NDA. The language of the Arbitration Proceedings shall be English. The place of Arbitration Proceedings shall be Bangalore, India.

10.3 The above clauses on Arbitration shall survive for three (03) years even after the expiry/termination of NDA.

10.4 It is expressly understood and agreed by and between XXX and ITI that ITI is entering into this NDA solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed between the Parties that the Government of India is not a party to this NDA and has no liabilities, obligations or rights hereunder. It is hereby expressly understood and agreed that ITI

is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable Laws of India and general principles of Contract Law. ITI represents and XXX expressly agree, acknowledge and understand that ITI is not an agent, representative or delegate of the Government of India. It is further understood and agreed between the Parties that the Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, XXX hereby expressly waive, release and forego any and all actions or claims, including cross claims, impleader claims or counter claims against the Government of India arising out of this contract and covenants not to sue the Government of India as to any manner, claim, cause of action or thing whatsoever arising of or under this NDA.

The Parties have signed two identical copies of this Agreement and have taken one copy each.

For and on behalf of	For and on behalf of
ITI Limited	XXXXXX
(Authorized Signatory)	(Authorized Signatory)
Name:	Name:
Designation:	Designation:

ANNEXURE-XIII

OLT, ONT and Installation & Commissioning at Block and Gram Panchayat

1. BIDDER 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 BIDDER needs to supply as per site survey.

2. The number of patch cords to be supplied with the OLTs shall be four more than the number of PON ports for each type of OLT (total 20 patch cords). The patch cords specification shall be as per TEC GR. The patch cords will be of LC/SC PC (point contact)/APC (Angular Point Contact) type based on specification of OLT optical port and FTB / FDMS ports.

3. Installation of OLT, ONT at the Block and Gram Panchayat respectively in coordination with State /SIA. Installation of FDMS and Rack (wherever applicable)

4. Testing of traffic from the ONT at Gram Panchayat to the Block OLT and further to State NOC and BBNL central NOC.

5. General site readiness like provisioning of proper Earthing, racks installations, rack grouting etc. shall be carried out by the BIDDER at no extra cost to State/SIA.

6. Additionally, in case the Gram Panchayat end point where the ONT has to be installed, does not have appropriate plug points/ wiring, the BIDDER shall draw the electrical wiring from the nearest junction box to the ONT (with requisite plug points etc.) at no extra cost to State/SIA. Further, BBNL will negotiate with Energy department of Andaman Nicobar for rural areas to get unmetered connection for unhindered dedicated electricity supply for the infrastructure (Bypassing the GP connection), in such a case the co-ordination with electricity service provider and getting requisite connection up to the place of ONT/FTB will be in scope of BIDDER along with all costs.

Annexure-XIV

Declaration that the Bidder has not been blacklisted/debarred

(To be submitted on Non-Judicial Stamp Paper of Rs. 100/- duly notarized)

Place:
Date:
To,
<name and address>
Ref: Tender Notification no dated
Subject: Declaration of Bidder being not blacklisted

Dear Sir,

It is certified that our firm/company or any of our entity is not black listed/Debarred from doing business or put on holiday list etc. by any Govt. Organization / PSUs for any reason. However, if we fail to complete the awarded work / fulfill the Tender conditions or if any of the information submitted by our company or its employee or associate, proves to be false, ITI Ltd shall be free to take action / black list our firm / company notwithstanding of taking any other legal action."

Place :
Date :
Bidder's Company Seal :
Authorized Signatory's Signature :
Authorized Signatory's Name and Designation:

Annexure XV

Form of Bid-Securing Declaration

We, the undersigned declare that:

We understand that, according to your conditions, Bids must be supported by a Bid-securing Declaration.

We accept that we are required to pay the bid security amount specified in the Term and Condition, failure to do so will automatically exclude us from being eligible for Bidding or submitting Bid in any contract with the employer for the period of two years if we are in breach of our obligation(s) under the term and condition prescribe for ticketing vide invitation letter no: …….

a) Have withdrawn our Bid during the period of Bid validity specified by the Bidder in the Form of Bid; or
b) Having not accepted the correction of errors in accordance with the instructions to Bidders ITB or
c) Having been notified of the acceptance of our Bid by the Employer during the period of Bid validity.
    i) Fail or refuse to furnish the performance security in accordance with the ITT, or
    ii) Fail or refuse to execute the contract in accordance with the ITB.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of

i) Our receipt of your notification to us of the name of the successful Bidder: or
ii) Thirty (30) days after the expiration of our Bid.

Sign and Seal

Name of Authorized Official

Legal Stamp