



**Indian Institute of Technology, Kharagpur
Kharagpur 721 302, WB, India**

TENDER NO. IIT/CIC/NW/OFC/OD/LAYING/2018-19/24

DATED 18th SEPT 2018

SUB: PROCUREMENT AND LAYING OF OUTDOOR OPTICAL FIBER CABLE THROUGH PLB HDPE PIPE BY OPEN TRENCHING/MICRO TUNNELING METHOD AND ASSOCIATED WORKS

Indian Institute of Technology Kharagpur, an Institute of National Importance, invites sealed bids from reputed financially sound bidders who have adequate credential for supplying and laying of optical fiber cable in IITs or similar Autonomous Institutions /Universities, Government /Public Sector Undertakings, etc., for procurement and laying of optical fiber cable with **one year** onsite warranty for expansion of existing campus network.

Interested bidders are requested to send their sealed bids under a **two cover system** as per requirement mentioned in tender document, along with the Technical Specifications & Compliance Certificate (as mentioned in **Annexure-1 to 4**) and the quantity as specified in tender document.

Details are also mentioned in the Institute website **www.iitkgp.ac.in** [link: tenders].

There will be a pre bid meeting which will be held on **26.09.2018 at 3:30PM** in the Office of the Head, Computer and Informatics Centre, IIT Kharagpur. Interested bidders may visit the site along with IIT Kharagpur representative on **26.09.2018 at 11:00AM**. The final quotation for consideration is to be sent in a sealed packet, containing two separate sealed envelopes (**Technical Bid** and **Price Bid**) duly superscripted with Reference Number (Tender Notice No. **IIT/CIC/NW/OFC/OD/LAYING/2018-19/24 dated 18th September 2018**), to the Office of the **Head, Computer & Informatics Centre, Indian Institute of Technology, Kharagpur, P.O. Kharagpur Technology, PIN : 721 302 on or before 26th October 2018 at 3:00 pm**.

The **technical bids which will be opened on 26th October 2018 at 3:30 pm** in the presence of the bidders and their authorized representatives and price bids will be opened (to be notified separately), only of those firms, who will be found technically qualified/shortlisted, after evaluation of their technical bids.

**Head
Computer & Informatics Centre**

Copy to:

- 1. Institute website**
- 2. Notice Board**
- 4. CPPP**

PROCUREMENT AND LAYING OF OUTDOOR OPTICAL FIBER CABLE THROUGH PLB HDPE PIPE BY OPEN TRENCHING/MICRO TUNNELING METHOD AND ASSOCIATED WORKS

Introduction

Indian Institute of Technology Kharagpur has its own state-of-the-art campus wide network based on optical fiber cable (OFC) extended to different departments/centres/schools/sections, hall of residences and different residential quarters/ complexes. This optical backbone is expanding as new constructions occur. Operation and maintenance with high uptime of this huge network is also a real challenge to meet highest level of user satisfaction. In view of this the Institute has decided to procure some optical fiber cable and lay the cable to extend the network.

1. Scope of work:

- I. The scope of the work includes supply and laying of OFC (supplied plus stock available in CIC will be used as per requirement) through Permanently Lubricated (PLB) HDPE pipe by open trenching/micro tunneling method and associated works along with maintenance of the same for a period of one year from the completion of the entire project.
- II. Complete delivery of the materials has to be accomplished within six weeks from receipt of the purchase order. Services for Phase-1 has to be accomplished within eight weeks from receipt of the purchase order, Phase-2 has to be completed within twelve weeks from the receipt of the purchase order and Phase-3 to be completed within sixteen weeks from the receipt of the purchase order. Total project will be completed within sixteen weeks from receipt of the purchase order, failing which Liquidation Damage (LD) @ 1% per month of the total order value will be imposed as per Institute purchase rules. Total liquidated damage will be capped at 5% of the PO value.
- III. The installation would be deemed as complete, after the delivery of OFC cable and laying of OFC, testing of OFC links and final acceptance and certification by Head, CIC, IIT Kharagpur. The warranty period will start after the final acceptance and certification by Head, CIC, IIT Kharagpur after the entire work is completed.
- IV. Selected bidder will have to provide maintenance within the warranty period without disturbing the existing OFC links of the network.
- V. Any link found defective except force majeure issue to be restored within a day after logging the case to the bidder within the warranty period. This type of rectification should be the responsibility of the selected bidder without any financial commitment from IIT Kharagpur.
- VI. The length of cable routes and the cables lengths laid in trenches through pipes /ducts shall be measured by use of RODO meter/Measuring tape/OTDR. This will also be cross verified with the marking of lengths on the cables.
- VII. The quality of Optical Fiber Cable Plant depends upon the quality of individual items of work involved i.e. depth of cable laid, care while laying, protection, jointing of cables and termination in equipment room and on documentation of OFC cable plant. In order to ensure quality in cable laying work, each component of work needs attention. The work shall be carried out strictly in accordance with specifications laid down to achieve the requisite quality aim.

- VIII. **Documentation, Acceptance and Testing:** The purpose of acceptance and testing is to verify integrity of measurement and quality of work done. A complete document mentioning length of cable routes, marking of the routes in the Institute provided AUTOCAD map specifying the pit (cable duct joint) /chamber (OFC joint/ pulling chamber) locations and the cable routes, As-Built Document (ABD) report (consisting of three point location of pits/ chambers, GPS details of pits/chambers, depth chart report), Duct integrity test report, optical loss test using laser source power meter test (LSPM) and OTDR of each fiber core and marking of cores on LIUs to be submitted at the end of the installation.
- IX. **Easements, Permits, Licenses and Other Facilities:**
- (a) Wherever necessary the bidder shall ask the Institute for arranging the necessary ROW from the Competent Authority or any other authority.
 - (b) The bidder shall be fully responsible for obtaining all necessary easement, permits and licenses, for moving all construction equipment, tools, supplied materials and men across Railways and Highways, across public or private road as well as premises of any public utility within the right of user and for bearing all costs that may be incurred in respect of the same.
- X. **Protection of Life and Existing Underground Service Facilities:** The bidder is fully responsible for taking all possible safety precaution during preparation of underground cable pathways and for keeping the construction site in a safe condition. The bidder shall protect all life and property from damage or losses resulting from his construction operations and shall minimize the disturbance and inconvenience to the campus community. They should use ground penetrating radar (GPR) survey along the proposed path and should submit the underground utility report along with test documents. If any damages occur to other service lines like electrical, water pipelines, drainage, sewerage, any part of existing structure, building or element then the same has to be informed immediately to CIC and to be restored by the bidder without any extra cost, failing which IIT, Kharagpur will be at liberty to rectify and restore the damages at the risk & cost of the bidder.
- XI. **Security Passes:** The bidder should provide a list labours who will be executing the job before commencement of the work so that CIC can arrange suitable entry passes from Institute security section.
- XII. The job will be given on contract basis to the selected bidder. Arrangement of labours including their safety/precautions has to be managed by the bidder at his own risk and cost.
- XIII. **Compliance With Laws And Regulations:** During the performance of the works the bidder shall at his own cost and initiative fully comply with all applicable laws of the land and with any and all applicable by-laws, rules, regulations and orders and any other provisions having the force of law made or promulgated or deemed to be made or promulgated by the Government, Governmental agency or IIT Kharagpur, municipal board or other regulator or authorized body or persons and shall provide all certificates of compliance therewith as may be required by such applicable law, By-laws, Rules, Regulations, orders and/or provisions.
- XIV. **Tools and Plants:** The bidder shall provide at his own cost all tools, plants appliances, implements, measuring instruments etc. required for proper execution of works. The bidder shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works, counting, weighing and assisting the measurements for examination at any time and from time to time. The bidder shall be responsible to make all arrangements, at his own cost for de-watering of trenches/ducts and de-gasification of the ducts before carrying out the work. The bidder shall also be responsible

to make arrangements, at his own cost, for water required for carrying of works at sites including curing of CC/RCC works.

- XV. **Route Marker:** Route markers are also to be placed along the OFC cable route at 200 meters apart and where route changes direction like road crossings etc. The route markers made of pre-cast RCC should have the following dimensions: Base (250 mm x 250 mm); Top (125 mm x 125 mm); Height (1200 mm). The word '**CIC OFC**' should be engraved on the route markers. The route markers are to be painted yellow and the same are placed at 2 ft. away from the center of the trench. The engraved word '**CIC OFC**' should be painted in black, on route markers.
- XVI. **Joint / pulling chamber:** The joint/pulling chamber is to be provided wherever it is required to keep the O.F.C. joint well protected, to keep extra length of cable which may be required in the event of faults at a later date and to ensure the branching of the cable route. The joint chambers are to be made at site by the bidder using bricks and mortar or are of pre-cast RCC type.
- XVII. **Trenching Near Culverts/Bridges:** The PLB pipes shall be laid in the bed of culvert at the depth not less than 165 cms protected by G.I. pipes/ RCC and concreting as decided by CIC. Both ends of culverts shall be excavated more than 165 cms in depth to keep the gradient of not less than 15 degree with horizontal. The bed of trench should be as smooth as possible. While carrying out the work on bridges and culverts, adequate arrangement for cautioning the traffic by way of caution boards during day time and danger lights at night shall be provided. In case of small bridges and culverts, where there is a likelihood of their subsequent expansion and authorized, the cable should be laid with some curve on both sides of the culvert or the bridge to make some extra length available for re-adjustment of the cable at the time of reconstruction of culvert or the bridge. Institute is constructing new bridges over a canal in the hospital route. If the bridge is not constructed during the OFC laying work then bidder has to take the responsibility for making the arrangement Over Head cable laying across the said canal. Once the bridge is constructed the overhead OFC has to be placed in the arrangement provided in the bridge.
- XVIII. **Manual trenching and refilling:** Manual trenching depth should be minimum 165 cm for normal and hard soil, minimum 100 cm for concrete areas and boring/tunneling method should be used in case of crossing of concrete/bituminous roads at 165 cm (minimum) depth. The trench must be refilled with soft soil or re-cementing to be done depending on the type of trench after laying the OFC through HDPE duct. Aesthetics must be maintained with the existing construction while excavating or refilling the cable the cable trench.
- XIX. **Micro Tunneling:**
- A. Horizontal boring and PLB pipe laying through it along road and under road/ canal crossing in all type of soil at suitable depth including all civil works. Supply of all tested lifting tools and tackles other required equipment and consumables, labour etc. and making all such necessary arrangements are under bidder's scope. The work is specified under two major heads.
- (a) Laying along the road.
- (b) Road/canal crossing (road crossing means crossing a road of minimum width of 3 mtr.)

Under each head there will be again three different sizes of boring:

- (a) Boring for single pipe to double pipes.
- (b) Boring for three pipes to four pipes.
- (c) Boring more than four pipes up to eight pipes.

The PLB pipe will be pulled through the horizontal bore with insertion of nylon rope arranged by the bidder. Duct integration test is to be carried out for each pipe in case of without rope pipes.

B. Specification for PLB Pipe laying by Micro Tunneling:

- (a) Guided boring / drilling technology is to be used. Mechanical mores are not permitted.
- (b) Radio or any other detection system should be used for avoiding damage to existing underground utilities i.e. electric supply, water pipe lines, telecom copper cables and optical fiber cables, sewerage etc. The bidder shall carry out ground penetrating Radar survey along the proposed cable route at his own cost to identify the underground services. However for safe drilling the bidder should make requisite inspection and test pits whenever necessary
- (c) The depth of boring should be such as to clear any underground utilities/obstacles. However in no case the depth of boring be less than 2m from the road surface.
- (d) In horizontal boring the system should be capable of going up to 10 mts below the ground level.
- (e) As far as possible cable should be laid in drum lengths and cutting of cable should be avoided while laying along road.
- (f) Guarding at work site is to be done by the bidder.
- (g) At the time of laying, jack and wheel should be used so that the OFC or pipe is not damaged.
- (h) Institute will provide required water for the purpose of the HDD on chargeable basis. Institute will also provide required electricity in case of maintenance of HDD machineries on chargeable basis.
- (i) Permission for the proposed/requested cable route will be obtained by CIC from different service sections of Institute.
- (j) Digging of test pit and restoration of pits are to be done by the bidder.

XX. **OFC Route Diagrams:** This diagram shall consist of pipe route details on Institute campus geographical map drawn to scale with prominent land marks and alignment of pipe with reference to road. This has to be prepared in AUTOCAD. Soft and hard copies of the ABD report (consisting of three point location of pits/ chambers, GPS details of pits/chambers, depth chart report, etc.) and Duct integrity test report to be submitted to CIC.

XXI. Bidder should submit the complete project execution plan with time line within 10 days of the receipt of the purchase order.

2. Pre-Qualification Criteria:

- I. The bidder should have minimum 03 years of working experience in India in the domain of OFC network infrastructure, with sales and support office in Eastern India. The bidder should have at least 5 orders for supply/laying of OFC (each of minimum Rs. 15 Lakhs) in the last 3 years. Copies of purchase orders to be submitted as supporting documents.
- II. The bidder should be a profit making entity for each of the last 3 years. Audited P & L reports to be submitted as supporting document.
- III. The bidder should not have been blacklisted by any IITs or similar Autonomous Institutions /Universities, Government /Public Sector Undertakings on the date of submission of this bid. A declaration from the bidder must be submitted.

- IV. The bidder should have a minimum turnover of Rs. 2 Crores per annum during each of last three financial years. Audited balance sheet must be provided.
- V. Bidder must have HDD machine and DIGI track ownership rights. Supporting documents must be submitted.
- VI. Bidder must have credential of minimum 20 KM underground OFC laying for any telecom operator or other Govt. /private organization in last three years. Supporting documents must be submitted.
- VII. OEM of OFC and accessories should have Industry presence in India for more than 10 years. Supporting documents must be submitted.
- VIII. OEM of OFC should be an Engineering Participating Member of Telecommunications Industry Association committee. Supporting documents must be submitted.
- IX. All OFC cables & components offered should be ROHS mentioned in Data Sheet. Supporting documents must be submitted.
- X. OEM of OFC Should be ISO certified organization. Supporting documents must be submitted.
- XI. All passive OFC products must be from single OEM & should have 25 years of channel performance and component warranty. Supporting documents must be submitted.

3. General Terms & Conditions:

- I. **Last Date of Submission of Sealed Bids: 26th October 2018 by 3:00 pm** (In the Office of the Head, Computer & Informatics Centre, Indian Institute of Technology Kharagpur).
- II. **Date of opening of the Technical Bids 26th October 2018 at 3:30 pm** (In the Office of the Head, Computer & Informatics Centre, Indian Institute of Technology Kharagpur).
- III. **Payment Terms:**
 - (a) No advance payment to be made to mobilize the resources at work place.
 - (b) **For OFC laying and associated work:** 90% payment for each Phase (total three Phases as per Table-1) will be made after the successful completion of the job for that phase. The cost of a phase will be determined from the price quoted as per the format in table 3, based on actual measurements and use of associated materials (as specified in table 2) for that phase.
 - (c) For material supply: 90% payment will be made against successful supply and acceptance of all materials as specified in table 2 in good condition.
 - (d) Balance 10% of the payment of total ordered value will be made after successful completion of the entire job on submission of Bank Guarantee of 10% of the total purchase value valid for a period of one year plus three months.
- IV. **Price:** Bidders are to quote and accept their payment in Indian currency. The price shall be quoted with cost break-up indicating unit prices for each component. **Price must be quoted in Indian Rupees (INR) only.** Price must be quoted as per format given in tables 2 and 3.
- V. **Tender Fee:** An amount of **Rs. 10,000.00** (Rupees ten thousand only) as tender fee (nonrefundable) has to be paid. The payment shall be made by Demand Draft from any Bank in favour of "Indian Institute of Technology Kharagpur", payable at "Kharagpur". **Quotation**

will not be accepted without the Tender Fee. Tender fee should be enclosed separately in an envelope and stapled with the Technical Bid.

- VI. **Earnest Money Deposit (EMD):** An amount of **Rs. 3,00,000.00** (Rupees Three Lakh only) (Refundable) in the form of Demand Draft drawn in favour of “**Indian Institute of Technology Kharagpur**”, payable at Kharagpur or Bank Guarantee as per format at **Annexure 5. E.M.D. should be enclosed separately in an envelope and stapled with the Technical Bid document superscribing EMD.** The validity of the EMD should be 6 (six) months from the date of issue. **Any bid without EMD will summarily be rejected. No interest is payable on EMD.** EMD will be refunded to the unsuccessful bidder, finalization of the tender process. The EMD of bidder awarded with the contract to be treated as part of security deposit towards Performance Guarantee. No interest is payable on Security Deposit. Security Deposit shall be forfeited if the selected bidder after award of contract fails to execute the same.
- NOTE: IIT Kharagpur will give exemption for submission of tender fee and EMD who are registered with MSME or Central Purchase Organization or startups as recognized by DIPP as per revised rule 170 of GFR -2017 only. However proper and valid document in this regard must be submitted by the bidders in support of their claim.]
- VII. Conditional Offer will not be accepted.
- VIII. **Period of Validity:** Bids shall remain valid for acceptance for a period of 120 days from the date of opening of the price bid but any benefit for **downward revision of prices should be extended to the IIT Authority.**
- IX. Past Performance of the bidders will be judged at the time of Technical evaluation.
- X. Complete delivery of the material and service have to be accomplished within **Sixteen Weeks** of receipt of the purchase order, failing which Liquidation Damage (LD) will be imposed as per Institute purchase rules (refer clause II of Scope of work).
- XI. Technical bid (should also contain the detailed un-priced bill of material) and price bid should be sealed and quoted separately. The technical bid will be evaluated first for technical suitability. Only technically qualified bids would be considered for price comparison. Price bid should be quoted in the given format (**Table-1 and 2**) indicating the tax components. In case of ambiguity between total price quoted and that calculated from unit price for each line item, unit price will be taken as final.
- XII. The authorization letter, for optical fiber cable and accessories, issued by the OEM (specifically against this tender) should be enclosed in original (if OEM is not the bidder).
- XIII. Service quantities mentioned in the tender are tentative. Actual quantities will be determined based on the joint measurement basis after executing the job. bidder should measure the cable routes and other service items in presence of CIC representative.
- XIV. Technical bid should contain all relevant technical details which may be necessary to ensure that offer is complete in all, respect e.g. technical specification, delivery period, warranty period, validity, etc.
- XV. Technical bid should also contain a signed “compliance certificate” (Specification Annexure – 1 to 4) duly counter signed by the manufacturer or bidder.
- XVI. Bidders should also enclose the following documents in the technical bid as proof of their credential:

- ❖ Tender fee
- ❖ Earnest Money Deposit (EMD)
- ❖ Certificate of Registration
- ❖ Income Tax Certificate of last three years, PAN Number and GST Number.
- ❖ Banker's Solvency Certificate.
- ❖ Summary of Audited Statement of Accounts for the last three years.
- ❖ Order copies from organizations to support the evidence of job experience of laying 20KM OFC as specified in Pre-qualification Criteria.
- ❖ At least 5 orders for supply/laying of OFC (each of minimum Rs. 15 Lakhs) in the last 3 years.
- ❖ Signed Tender document as a token of acceptance for the Terms & Conditions specified in various sections of the Tender Document

4. Acceptance of Tender

- I. The Institute does not bind itself to offer any explanation to those bidders whose technical bids have not been found acceptable by the evaluation.
- II. The Institute does not bind itself to accept the lowest tender and reserves the right to reject any or the entire tender received without assigning any reason thereof.
- III. The bids (technical and price bids) once submitted shall be the property of the Institute and shall not be returned to the bidder in future.
- IV. A bid submitted with false information will not only be rejected but the bidder may also be debarred from participation in future tendering processes.
- V. Canvassing in any form not only invites disqualification in this tender but also debar the bidder participation in the future tendering processes.
- VI. **Opening of Price Bids:** The Price Bid(s) of only those bidder(s) who are found technically qualified will be opened. The date and time will be informed separately.
- VII. Authorized representative (with proper authorization letter to attend opening of technical bids and also for opening of price bids) may choose to be present at the time of opening of Technical Bids/Price Bids.
- VIII. Director may accept or reject any or all the bids in part or in full without assigning any reason and does not bind himself to accept the lowest bid. The Institute at its discretion may change the quantity/upgrade the criteria/drop any item or part thereof at any time before placing the Purchase Order. In case of any dispute, the decision of the Director of this Institute shall be final and binding on the bidders.
- IX. This Tender Document and the Contract shall be governed by and interpreted in accordance with Laws in force in India. The Courts at Midnapur shall have exclusive jurisdiction in all matters arising under the contract.

For any query pertaining to this tender, correspondence may be addressed to:

**The Head, Computer & Informatics Centre
 Indian Institute of Technology,
 Kharagpur-721 302
 Email: head@cc.iitkgp.ac.in**

In case the due date for submission and/or opening of the tender happens to be a holiday, the same will be accepted on the next working day. The timings will however remain unchanged. Please Note that the Institute remains closed during Saturdays & Sundays.

5. OFC Route Details

Table 1: List of Routes with tentative path lengths

Link No.	Name of the Route	48 Core OFC in meter	24 Core OFC in meter	Existing Building Duct/ Shaft	2-duct in Meter	4-Duct in meter	6-duct in meter	8-duct in meter	Number of Chamber	Total Length of HDPE in meter	Route Marker
PHASE-1											
1	CIC to Hospital via RDC	2800		400	1000	400	750		15	8100	70
1a	CIC to APC Complex		1500		650				4	1300	22
1b	CIC to Nalanda Complex Admin Block(2nd Link)		700	250	50				1	100	2
Total		2800	2200	650	1700	400	750		20	9500	94
PHASE-2											
2	CIC to Hospital via Gurukul Complex	4000		400	2300		800	300	20	11800	115
2a	New VSRC G+7	1700			400				2	800	15
2b	CIC to Diamond Jubilee		1100		200				1	400	7
2c	CIC to new block of JCB Lab Complex		900		200				1	400	7
Total		5700	2000	400	3100	0	800	300	24	13400	144
PHASE-3											
3	CIC to E&ECE		1400		50				1	100	2
3a	CIC to Rajendra Mishra		1500		200				2	400	7
3b	CIC to Mining		1700		400				3	800	14
3c	CIC to Central Library		1200		0				0	0	0
3d	CIC to MMM &LBS Hall		2000		50				1	100	2
3e	CIC to BCR Hall		1400		100				1	200	3
3f	CIC to AJCB Hall		1900		150				2	300	5
3g	CIC to SN Hall		1100		100				1	200	3
3h	CIC to BRH Hall		3200		1100	900	750		18	10300	100
Total		0	15400	0	2150	900	750		29	12400	136

Table 2: List cum Price bid format for materials

S/N	Description	Specification	Qty. (no.)	Unit Price (Rs.) with one year warranty	Tax (Rs.)	Total Price (Rs.) with one year warranty
1.	48 core armored OFC (SM)	As per Annexure-1	02 KM			
2.	24 port single mode LIU fully loaded	As per Annexure-2	26 nos.			
3	48 port single mode LIU fully loaded	As per Annexure-2	06 nos.			
4	OFC outdoor joint enclosure 24F JC	As per Annexure-3	20 nos.			
5	OFC outdoor joint enclosure 48F JC	As per Annexure-3	10 nos.			
6	PLB HDPE Duct (40/33mm dia) Green 10 Km, Orange 10 Km, Blue 8 Km, Yellow 7 Km	As per Annexure-4	35 KM			
Total Price including all Taxes with one year comprehensive onsite warranty						

Table 3: List cum Price bid format for services

S/N	Description	Quantity	Unit rate (Rs.)	Tax (Rs.)	Total Cost (Rs.)
1	Excavation of trenching to a depth of 165cm in any type of soil with 45cm at top and 30cm at bottom with clearance of all obstructions, removal of water if required and refilling as specified in scope of work.	500 meters			
2	Excavation of trenching to a depth of 100cm in concrete areas with 45cm at top and 30cm at bottom with clearance of all obstructions, removal of water if required and refilling as specified in scope of work.	100 meters			
3	Transporting, laying, jointing using 40 mm push fit coupler and strengthening of PLB HDPE pipes (40/33 mm) in excavated trench/tunneling trench including pulling of 4mm dia nylon rope with sealing the section with end plugs a) One to two duct b) Three to four duct c) More than four duct up to eight duct	6950 mtrs. 1300 mtrs. 2600 mtrs.			
4	Transporting, laying, jointing, fixing on wall with saddle and strengthening of PLB HDPE pipes (40/33 mm) in excavated trench including pulling of 4mm dia nylon rope with sealing the section with end plugs	1050 meters			
5	Supplying, Transporting and laying, jointing of GI Pipes (100mm) at road crossing swampy areas in the excavated trenches.	100 meters			
6	Construction of brick chamber (1 M X 1M X 1.5 M) to provide protection on slopes and embankments providing 15mm plastering surrounding the brick chamber. Thickness of the	75 nos.			

	wall of chamber is 25cm with ratio of cement and sand 1:5 (1st class brick and ISI marked cement to be used). Brick chamber should be covered by removable concrete (RCC) slab of appropriate size with iron cage and GI handle such that cable maintenance can be done in future as per requirement. CIC OFC logo should be engraved on the cover. The rate includes supply of materials.				
7(a)	Fixing of GI pipes (100 mm) supplied by the bidder connecting in random supported on hangers, brackets and clamps attached to the outside of the parapet wall/railing of bridge as per direction with perforation and painting of GI pipes with clamps and hangers by synthetic enamel paint.	60 meters			
7(b)	Supply of nuts, bolts, brackets, hangers, clamps, and accessories require for hanging	LS			
8	Crossing any type of road by manual boring up to 50 mm dia PLB/GI pipe above 3mtr length of pipe including the cost of pipe laying under 165cm depth.	100 meters			
9	Pulling of 24F/48F cable to the laid duct including all associated works as per scope of work. Rate includes transportation of cable drums to the site.	28100 meters			
10	Supply and fixing of RCC Route/Joint indicators of 124mm x 125mm on top, 250mm x 250mm on the bottom & 1200mm height and CIC OFC Logo engraved on the top portion, painting with yellow synthetic enamel paint & sign writing CIC OFC portion with black synthetic enamel & red for J/I including transport at site	375 nos.			
11	Horizontal Directional Drilling & Laying of PLB PIPE of 40/33mm dia through boring by "NO DIG" method using trenchless technology and other associated works along road and under road/ canal crossing in all type of soil (including soft rock & hard rock) at suitable depth including all civil works. Total job has to be completed within time schedule mentioned in the tender document. The rate includes transportation of materials from departmental store depot to the work site within a distance of 5Km. [refer clause no. 1. XIX]				
11 a	Single duct to double duct	6950 meters			
11 b	Three duct to four duct	1300 meters			
11 c	Four duct upto eight duct	2600 meters			
12	Splicing & termination per joint chamber	30 nos.			
13	Splicing of 24 core OFC in LIU and fixing it in network Rack	26 nos. of LIU			
14	Splicing of 48 core OFC in LIU and fixing it in network Rack	6 nos. of LIU			
Total Price including all Taxes with one year comprehensive onsite warranty					

ANNEXURE-1

Specification of 48 core armored OFC single mode

Sl. No.	Description	Complied(Y/N)
1	48 Core Singlemode 9/125, Multi Loose Tube Cables, High mechanical and full rodent protection provided by Outdoor – Corrugated Steel Tape Armor (CST), FRP central strength member, Gel filling cable core, CSTA armor, Single PE jacket (black).	
2	Multiloose tube construction with 12 number of fiber per tube, Each core should be with 9/125/250 μm .	
3	Each tube should have 12 number of different color coded fiber inside the tube like Blue, Orange, Green, Brown, Grey, White, Red, Black, Yellow, Violet, Pink, Aqua.	
4	Each Buffer tube in multiloose tube should also be differently color for ease of identifications: Blue, Orange, Green, Brown, Grey, White	
5	<p>PHYSICAL CHARACTERISTICS: Buffer Tube Diameter: 2.6 mm Buffer Tube Material: PBT – Polybutylene Terephthalate Buffer Tube Filling Material: Synthetic Thixotropic Gel. Central Strength Member Material - Fiberglass Epoxy Rod Overall Cabling Fillers: Polypropylene Cable Core Filling Material: Synthetic Thixotropic Gel</p> <p>ARMORING: Armor Type: Corrugated Armor Material: Steel Tape Armor Thickness: 0.15 mm</p> <p>OUTER JACKET: Outer Jacket Material: PE – Polyethylene Outer Jacket Nom. Wall Thickness : 1.6 mm Outer Jacket Color : Black</p> <p>OVERALL DIAMETER: Overall Nominal Diameter: 13.4 mm</p>	
6	<p>MECHANICAL CHARACTERISTICS: Operating Temperature Range: - 40°C To + 70°C Max. Load for Installation: 1500 N, Passes IEC794-1 Max. Load for Long Term Application: 600 N, Passes IEC794-1 Min Bend Radius for Installation: 20 × Cable OD, Passes IEC794-1 Crush Resistance: 1000 N/100mm, Passes IEC794-1 Impact Resistance / Solar Radiation Resistance / Water Penetration / Compound Flow / Cyclic Flexing as per Passes IEC794-1</p>	
7	Optical Characteristics: SINGLE MODE FIBERS (G652.D (OS2))	
	Specification	Parameter
	Typical Mode Field Diameter @ 1310nm	9.2 ± 0.4 μm
	Typical Mode Field Diameter @ 1550nm	10.4 ± 0.5 μm
	Cladding Diameter	125 ± 0.7 μm
	Clad Non-Circularity	≤ 0.7 %
	Core-Clad Concentricity Error	≤ 0.5 μm
	Primary Coating Material	Acrylate
	Primary Coating Diameter	245 ± 5 μm
	Secondary Color Coating Diameter	250 ± 10 μm
	Max. Attenuation @ 1310nm	0.36 dB/km
	Max. Attenuation @ 1550nm	0.22 dB/km
	Point Loss @ 1310nm & 1550nm	0.05 dB
Zero Dispersion Wavelength	1302 – 1322 nm	
Max. Slope @ Zero Dispersion	0.090 ps/(nm ² ·km)	

	Wavelength		
	Max. PMD @ Link Design Value	0.1 ps/√km	
	Cable Cutoff Wavelength	≤ 1260 nm	
	Refractive Index @1310nm	1.466	
	Refractive Index @1550nm	1.467	

ANNEXURE-2

Specification of 24/48 Fiber port single mode SC LIU fully loaded

S.No	Specifications	Complied (Y/N)
1	Applications: Backbone, Telecommunications Room, Main Distribution Room, Data Centres	
2	19" Rack mount fiber LIU, 1U Fiber LIU pre-loaded with SC Type Single Mode Coupler, Splice Tray and other fiber management accessories etc., should come with 12 duplex coupler (24F) or 24 duplex coupler (48F) in 1U. Pigtail should be additional.	
3	Fiber LIU should come with at least four cable entry position, fiber management kit & panel mounting kit.	
4	Material Steel, 1.2mm, textured powder coated paint, black (RAL9005)	
5	Panel should comply to : <ul style="list-style-type: none"> - International standard: ISO/IEC 11801 2nd edition (2002) and ISO/IEC 11801 Amendment 2 (2010) - IEC 61754-4 Ed. 1.2 b:2002 Fibre optic connector interfaces - Part 4: Type SC connector family 	
6	Panel should be ROHS certified mentioned in data sheet.	
SC ,Single Mode Pigtail Cable		
S.No	Description	Complied (Y/N)
1	Standard or custom assemblies	
2	Tight Buffer construction (0.9mm)	
3	Optical Fiber Pigtail should comply with TIA/EIA 568-C.3.	
4	Optical Fiber Pigtail should have Max. Tensile Strength of 30N (Short Term).	
5	Optical Fiber Pigtail should have Max. Crush Resistance of 100 N/100 (Short Term).	
6	Cable Sheath: LS0H	
7	Optical Fiber Pigtail should have Insertion Loss of ≤0.3dB @ 1310nm for Singlemode as per TIA/EIA 568-C.3	
8	Optical Fiber Pigtail should have Return Loss of ≥50dB @ 1310nm for Singlemode as per TIA/EIA 568-C.3	
9	RoHS Complaint	

ANNEXURE-3

Specification of OFC outdoor joint enclosure 24F JC/48F JC

S/N	Specifications	Complied (Y/N)
1	Applications: Backbone, Telecommunications Room, Main Distribution Room	
2	24F Or 48 Fiber Outdoor Joint closer, suitable to Outdoor, direct burial, aerial applications.	
3	Fiber LIU should come with at least 2 cable entry position, fiber management kit & ring with splice tray etc.	

ANNEXURE-4

Specification of PLB HDPE Duct (40/33mm dia)

S/N	Parameters	Specifications	Complied (Y/N)
1	Standard	As per specification no. RDSO/SPNTC/45/2013 Revision2.0	
2	Size Range	40/33 mm	
3	Packaging Size	Up to 1000 Meters	
4	Size/Diameter	40 mm OD	
5	Single Piece Length	500 Meters	
6	Application	Duct	
7	Colour	Green, Orange, Blue and Yellow	

Annexure-5

MODEL BANK GUARANTEE FORMAT FOR FURNISHING EMD

Whereas.....(thereinafter called the "tenderer") has submitted their offer datedfor the supply of(hereinafter called the "tender") against the purchaser's tender Notice No. KNOW ALL MEN by these presents that WE.....ofhaving our registered office atare bound unto (hereinafter called the "Purchaser") in the sum offor which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank thisDay of 20

THE CONDITIONS OF THIS OBLIGATION ARE

- (1) If the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of this tender.
- (2) If the tenderer having been notified of the acceptance of his tender by the Purchaser during the period of its validity:
 - (c) If the tenderer fails to furnish the Performance Security for the due performance of the contract.
 - (d) Fails or refuses to accept/execute the contract.

WE undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or both the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including 45 days after the period of tender validity and any demand in respect thereof should reach the Bank not later than the above date.

(Signature of the authorized officer of the Bank)

Name and designation of the officer

Seal, name & address of the Bank and address of the Branch