



**RFP for Selection of Implementation Agency for Survey,
Supply and Installation of Underground OFC, between NOC
to VSS route**

Ref. No. APSFL/UG/NOC-VSS/334/2018, Dated 05/01/2019

Andhra Pradesh State FiberNet Limited

NTR Administrative Block, 3rd Floor, Pandit Nehru Bus Station,

Vijayawada - 520013

Web address: www.apsfl.in

Email address: apsfl@ap.gov.in

1. Introduction

Andhra Pradesh State FiberNet Limited (APSFL) has been incorporated under the Companies Act 2013 in October 2015, to undertake the works of AP Fiber Grid, its operations & maintenance and related business activities. It is a fully owned entity of the Government of AP under the control of Energy, Infrastructure & Investment (E, I&I) department. APSFL aims to provide high quality & affordable digital services to households, government departments and enterprises across the State.

Fiber Grid is one of the 5 Grids identified by the Government of Andhra Pradesh to accelerate socio-economic growth of the State. Fiber Grid is primarily aimed at harnessing the power of information resource and enabling provision of qualitative and cost-effective IT, Communication (data, voice & video) and other related services to the citizens of A.P.

Vision of AP Fiber Grid is as follows:

“To establish a highly scalable network infrastructure, accessible on a non-discriminatory basis, to provide on demand, affordable and end-to-end broadband connectivity of 15 Mbps for all households and 1 to 10 Gbps for institutions & multi-dwelling units by 2018, to enable realization of the Vision of Digital Andhra Pradesh, in partnership with the Government of India and Private Sector.” In line with the vision, a dual phased approach has been undertaken to deliver the project mandate in AP.

Phase I – Aerial Fiber Grid Network will create an aerial fiber network up-to Mandal level by leveraging assets of Electricity companies.

Phase II - Aerial Fiber network covering the entire State up to Gram Panchayats level.

Phase I of the Project (Aerial Fiber grid project), APSFL has established state-wide high speed optical fiber network infrastructure covering approximately 23,000 kms route across the 13 districts of Andhra Pradesh through 2449 PoPs being operated and controlled from Network Operations Centre (NOC) setup in Vishakhapatnam. Phase I project components include laying aerial optical Fiber across the State up to mandal level, so that the State, District, Zonal and Mandals are connected with each other using ring topology as much as possible. In addition, the last mile connectivity is to be made available through a network of MSOs/ LCOs.

2. RFP Notice

Andhra Pradesh State FiberNet Limited (APSFL) invites sealed bids from the prospective bidders for Survey, supply, Installation of 6Km Underground OFC between NOC and VSS route . The bidders shall propose all the components as per the technical specifications mentioned in this TENDER and selected bidder(s) should support APSFL in providing reliable service delivery. The selected bidder should provide one year comprehensive onsite warranty for the equipment and four years maintenance from the date of commissioning of work

Key Events and Dates

Sl. No.	Description	Details
1.	Name of the Authority	Andhra Pradesh State FiberNet Limited
2.	Name of the Assignment	RFP for Selection of Implementation Agency for Survey, Supply and Installation of 6Km Underground OFC between NOC and VSS route
3.	TENDER Number	APSFL/ /UG/NOC-VSS/334/2018, Dated 05/01/2019
4.	TENDER Publishing Date	05/01/2019
5.	Last date and time for submission of proposals (Proposal Due Date)	18/01/2019 at 3:00 PM The proposal is to be submitted at APSFL Office, Vijayawada
6.	Date and time of opening tender	18/01/2019 at 4:00 PM Andhra Pradesh State FiberNet Limited NTR Administrative Block, 3rd Floor, Pandit Nehru Bus Station, NH -65, Vijayawada - 520013 Web address: www.apsfl.in Email address: apsfl@ap.gov.in
7.	Bid Processing Fee (Non-refundable)	INR 10,000 (INR Ten Thousand Only) in the form of Demand Draft issued by one of the Nationalized / Scheduled Banks in India drawn in favour of Andhra Pradesh State FiberNet Ltd' , payable at Vijayawada. Original DD must be submitted in APSFL office at Vijayawada before proposal due date.
8.	Bid Security / EMD (Refundable)	INR 25,000(INR Twenty Five thousand Only) in the form of Bank Guarantee issued by one of the Nationalized / Scheduled Commercial Banks in India drawn in favour of Andhra Pradesh State FiberNet Ltd , payable at Vijayawada. Original BG must be submitted in APSFL office at Vijayawada before proposal due date.

		Bid Security / EMD should be valid for a period of 180 days from Proposal Due Date. The Bid Security / EMD will be refunded to unsuccessful Applicant agencies within 30 (Thirty) days of completion of selection process.
9.	Performance Bank Guarantee	10% of the PO value with the validity of contract period + 3 months
10.	Warranty & Maintenance*	One year warranty + 4 years maintenance
11.	For any enquiries and clarifications, please contact:	Executive Director - Technical Andhra Pradesh State FiberNet Limited NTR Administrative Block, 3rd Floor, Pandit Nehru Bus Station, Vijayawada - 520013 Web address: www.apsfl.in Email: edt.apsfl@ap.gov.in
12.	Validity of the Proposal	Bidder proposals shall remain valid for a period of 180 days from the Proposal due date.
13.	Method of Selection	L1

Details of Bank for EMD:

Name of Beneficiary	Andhra Pradesh State Fibernet Limited
Name of Bank	Andhra Bank
Bank address	Andhra Bank, Main Branch, RR Apparao street, Vijayawada, Andhra Pradesh
Bank Account No	100611100002032
IFSC CODE	ANDB0000606
MICR CODE	520011025
BRANCH CODE	000606

3. Scope of work

Andhra Pradesh State FiberNet Limited (APSFL) laid Aerial Optical Fiber cable for state ring connectivity from NOC- Visakhapatnam to VSS Substation- Gajuwaka in the span of 26 Km under AP Fiber Grid Phase-1 Project. In that, there are no Electrical Poles available from NAD junction to Sheela Nagar Junction for about 6km span, because that OFC route runs beside the Visakhapatnam International Airport and due to that reason APSFL laid cable beside the road guard railing and resulting in frequent fiber connectivity issues.

In this regard, through this RFP, APSFL intend to select Implementation agency to provide the Under ground OF Cable connectivity from the NAD Junction, Vizag to Sheelanagar Junction, Viag for a span of 6 Km in the route of NOC to VSS Substation and complete the work within one month from the date of issue of PO

Commissioning Phase:

The scope of work shall comprise survey, supply of fiber including all the accessories, live line installation and commissioning of underground optical fiber cable. The fiber has to be terminated at the points provided by APSFL. The agency shall take care of the existing cable safety while laying the UG cable.

Must conduct the feasibility Survey/ Study based on the requirements provided by the APSFL and propose the best possible solution

A. Field/Route Survey

- The service provider has to carry out the route /field survey and submit the feasibility report and route map (along with Latitudes and Longitudes) of fiber for approval/clearance from APSFL to commence the work within 3 days of the PO
- The vendor shall finalise the exact distance of the UG OFC, location of the Manholes and loop chambers and submit a schematic diagram.
- On the basis of the survey reports done by Vendor and further approved by APSFL, 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.
- 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 APSFL shall provide necessary documents to the vendor. In case vendor pays fees/deposits

for RoW on behalf of APSFL, the amount will be reimbursed to the vendor by APSFL upon submitting the original invoice and its relevant documents.

B. Fiber Implementation

- Bidder shall be responsible for supply, install & commissioning of Underground OFC between NAD Junction, Vizag to sheelanagar Junction, Viag as per the finalized route map during the survey.
- Providing additional protection by R.C.C. Pipes/DWC pipes and/or concreting/chambering, wherever required according to construction specification
- Bidder shall provide manhole/handhole for every 500 Meters or as per the feasibility upon approval from AAPSFL and shall be of NP3 HD20 size (990 mm Outer diameter / 800 mm inner diameter) or construction of brick wall 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.
- 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. The jointing chambers are constructed by way of fixing pre-cast RCC chambers/Brick Chambers and covers as per the instructions from APSFL.
- The joint chambers have to be provided where ever required to keep the O.F.C. joint well protected and also to keep extra cable, which may be, required to attend the faults at a later date. Jointing chambers are to be prepared and 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 APSFL.
- In built up areas, the Vendor shall resort to use of manual labor/ HDD only to ensure no damage is caused to any underground or surface installations belonging to other public utility services and/or private parties.
- The 24F fibers are to be spliced at every Joint & at both ends (Terminations) as directed by the APSFL. The Infrastructure required for cable splicing i.e. Splicing machine, OTDR, Tool kit etc. shall be arranged by the Vendor and also any additional accessories. e. g. Engine etc. required at site for splicing shall also be arranged by the Vendor.

- The Optical Fiber Cable thus jointed end-to-end shall be tested by the APSFL representative for splice losses and transmission parameters. Optical Fiber should meet all the technical parameters, specified and no relaxation will be granted.
- The vendor shall provide GIS coordinates of the laid fiber clearly tagging signages wherever installed/provided for APSFL's record & verification.
- Route Tags & Signage for every 500 Mtrs., at Man Holes/ Hand holes.

Operations and Maintenance Phase:

After commissioning, the maintenance of underground OFC as per the Service Level Agreements (SLAs) should be done for the duration of this contract from date of commissioning.

4. Schedule of Requirement

S No	Item description	Units	Quantity
1	Supply, Installation of Supply of 24 Core Optical Fiber Under Ground Cable as per specification	Meters	6500
2	HDPE Duct	Meters	12500
3	Joint Enclosures	Nos	4
4	Man Hole	Nos	12
5.	Route markers	Nos	12
6	Warning Tape	Meters	6000

5. Technical specifications for underground execution

1. Cable Type: 24 F Armoured
 2. No.of Ducts to be laid in trench: 02 Nos
 3. Distance between MH to MH: 500 Meter's
 4. Depth: 1.2 Meter
 5. Methodology: HDD, if it is not feasible open trench methodology.
 6. The splice joints should not be less than 2 kms
 7. Route Markers at every 500 mts.
- Markers shall be installed in a manner that 500 mm length is below ground and 750 mm is exposed. Fixing of the route markers shall be done at 0.5 M from the trench and away from the road center

HDPE Duct specifications:

The nominal size of the duct shall be 40mm and shall meet the following requirements.

1. outside diameter 40 mm + 0.4 mm
2. Wall thickness 3.5 mm (+0.2 mm/ -0.00 mm)
3. Standard length 1000 meters \pm 100 meter
4. Thickness of permanent lubricant, > 0.4 mm
5. Maximum outer diameter of ofc cable 16 mm or offered cable dia that can be installed by blowing technique.

Location and Alignment of Trench

Trench must be aligned according to permission granted by authority/ agency. However following guidelines must be adhered to

1. Cross pits must be made manually to check presence of any underground utilities at adequate spacing.
2. Trench boundaries shall be marked with rope / lime powder prior to digging in order to get trench in straight line.
3. Trench shall be located at lowest point of lower area if feasible. Trench must not come over field boundary or any heap of soil.
4. Trees and their roots must be by passed to avoid damage while trenching and ensuring safe passage of OFC with smooth curves.

Trenching Specifications: The trenching should be done on 1.2 mts depth otherwise bidder shall take approvals for the following deviations.

- Priority A: Depth should be 1.2 Meters Bare Ducts to be laid. (preferably)
- Priority B: Depth found between 1Mtrs to 1.2 Meters Ducts to be protected with DWC Pipe.
- Priority C: Depth found between 0.8 Meters to 1.0 Meters DWC with PCC (1:2:4) Protection should be given.

Warning tape should be laid 500mm from the NGL Level.

Crossings Using Existing Bridges / Culvert

Bridges and Culverts crossings to be done by HDD Methodology if in case HDD is not possible other deviation Clamping or DWC with PCC.

Ducts shall be installed inside DWC pipes (of diameter suitable for specified number of ducts) when duct are laid on/along bridge/culverts at locations approved by authorities. DWC pipe shall be used when the location is not exposed to direct sunlight. For locations exposed to direct sunlight, high winds or heavy rains GI pipes shall be used as protective measure. In exceptional cases, where authority does not permits use of GI pipe, DWC pipe shall be covered with a GI sheet to prevent direct sunlight and rain falling on DWC pipe. Or DWC with Box Concrete size of 300*300*300mm. As far as practical GI sheet should not touch the DWC pipe. Wooden/other low thermal conductivity material spacers can be used to maintain gap between DWC pipe and GI sheet.

Installation of OFC Ducts by Trenchless Techniques – HDD

1. All concerned authorities (water, oil and gas pipeline operators, telecom operators, power companies etc.) who may have their underground utilities in the area shall be informed well in advance and as built drawings obtained to ensure proper planning of HDD operation and drilling profile.
2. The ends of the HDPE ducts shall be sealed with end caps to prevent ingress of water, mud, debris or obstacles inside the man-hole.
3. The minimum depth at entry and exit pits shall be 1.2 Meter.
4. The intermediate Depth shall be 2.5 Meter.
5. At Coupler point depth shall be 1.2 Meter covered by Kadapa stone.

6. Service Levels & Warranty

The selected vendor (s) has to provide comprehensive onsite warranty for all the equipment supplied through this RFP for a period of one (1) year from the date of commissioning and maintain four (4) years as per the terms & conditions in the tender and to meet the SLA

Selected Bidder shall ensure the following SLAs else the corresponding penalties will be imposed.

SLA Parameter			
Sr. No.	Parameter	Permissible Range	Remarks
1	Time to Repair an OFC cut/fault	<= 4 Hrs.	TTR shall be counted from opening of TT to closing of TT Irrespective of Fault Restoration.
2	No. of OFC cut/250KM or part/month	One Cut	In case PIA has requested for finalizing alternate route due to road widening or any beyond control activity, and it has not been approved within 2 weeks' time by APSFL, then fiber cuts arising out of such cases should be excluded from SLA working. These will be addressed on best effort basis.
Essential Measures			
Sr. No.	Parameter	Permissible Range	Remarks
1	Documents to be submitted	Within 3 days	Documents related to any change in ABD due to fiber fault rectification/ diversion etc.
2	Splice loss per fiber joint	<= 0.2 dB	If splice loss is more than 0.2 dB, splicing to be done again and downtime to be counted in Continuity. Appropriate procedure shall be worked out for verification of splice loss.

1. For these calculations the route shall be defined as the section of fiber as unique identifiable route.
2. In case of route failure due to cable cut/damage when the services are disrupted /not available, for a period up to 4 Hours, the fault(s) shall be treated as Severity Level 1 and there shall be no penalty for fault rectification within the time.
3. In case the fault restoration time extends beyond 4 hours up to 10 hours, the fault shall be treated as Severity Level 2.
4. In case the fault restoration time extends beyond 10 hours up to 24 hours, the fault shall be treated as Severity Level 3.
5. In case the fault restoration time extends beyond 24 hours, the fault shall be treated as Severity Level 4.
6. The penalty for each of these Levels shall be as tabulated below. In case there is/are additional fault(s) on the route will be treated as new fault after restoration of existing fault.
7. Partial / temporary restoration of fault shall be treated as a repaired fault under emergency circumstances and the down time till the proper restoration of fault shall not be counted.
8. The penalties to be imposed for the restoration of different severity levels of faults are defined below:

Severity Level	MTTR	Penalty
Level 1	Up to 4 Hours	Nil
Level 2	4 Hours to 10 Hours	INR 2500 per route fault. (If one fault downs many POPs it is treated as one fault only)
Level 3	Beyond 10 Hours and less than 24 Hours	Additional INR 500 per Hour subject to maximum of INR 5000 per fault per route fault
Level 4	Beyond 24 Hours	Additional INR 1000 per day or part thereof subject to maximum of INR 15000 per fault per route. Any other concurrent fault on the same route to be treated as separate fault.

SLA Exclusions

1. Penalty should be excluded for Restoration for damage occurs due to Force majeure, natural calamities, Curfew or No work due to Government Order.
2. Penalty should be excluded for damage occurred due to ongoing work enrooted by other authorities and bodies.
3. Any Delay in restoration where restoration is possible only after taking downtime of the running route. In such cases permission to carry out planned outage will be provided by APSFL. These penalties should be excluded.
4. Normal log time is considered for penalty calculation is from 8 AM to 4 PM. If the fault is reported after 4 PM and the location far away to reach for maintenance activity the call shall be treated as reported next day 8 AM.
5. On holidays and festival days the penalty structure shall be limited to 50% except NOC and DHQs

6. Poles shifting / Trees cutting by Electricity Department and Power outages during routine maintenance shut down will not be considered for penalty.

7. Payment Terms

Installation & Implementation

- i. 90% payment of work order value (A) shall be made within 30 days of successful installation & commissioning of equipment at location upon acceptance certificate from authorized APSFL representative.
- ii. 10% payment of work order value shall be made on completion of work or on submission of PBG valid for 5 years.

Operations & Maintenance

Annual Payment would be paid at the end of every year.

8. Deliverables

- i. The Payment shall be released only after the submission of original invoice, signed delivery challan, and certification from Authority.
- ii. Submission of route map (Single line Diagram & As Built Drawing) with lat/longs
- iii. Submission of Drum test reports for all cores of fiber cable
- iv. Submission of OTDR Reports for the total length of cable for all cores (end to end)
- v. Submission of splicing report with Latlongs.
- vi. Submission of Inspection Test & Plan Reports (ITP) for Trenching, Ducting and Back filling, DIT, Blowing, splicing fiber optic cables both open trench & HDD
- vii. Submission of lat/longs for all man holes, hand holes with three point locations
- viii. Submission of No Objection Certificate from the concerned Authorities/ municipality/highway

9. Liquidated Damages

Subject to clause for Force Majeure if the bidder fails to complete before the scheduled date or if bidder repudiates the agreement before completion of the Work, APSFL at its discretion may without prejudice to any other right or remedy available to APSFL the Contract recover a maximum of 5% (five percent) of the total value of the work order from the successful bidder as Liquidated Damages (LD).

- 1% of the late delivered or deemed late delivered/installed deliveries/installations goods for One week or part thereof,
- 1.5% for Two weeks or part thereof,
- 2% for Three weeks or part thereof,
- 2.5% for 4 weeks or part thereof and so on subject to maximum of
- 5%. If the delay continues beyond 10 weeks, APSFL may terminate the contract.

APSFL 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 bidder in its hands (which includes APSFL's right to claim such amount against successful bidder's Bank Guarantee) or which may become due to the Implementation Agency. Any such recovery or liquidated damages shall not in any way relieve the bidder from any of its obligations to complete the Works or from any other obligations and liabilities under the agreement.

10. Annexures

Annexure I -EMD Format

(To be executed in Rs.100/- Stamp Paper)

To,
The Managing Director,
Andhra Pradesh State FiberNet Limited,
3rd Floor, NTR Administrative Block,
Pandit Nehru Bus Station,
NH – 65, Vijayawada – 520013

Bank Guarantee No:
Amount of Guarantee:
Guarantee covers from:
Last date for lodgement of claim:

This Guarantee executed by _____ (Banker's Name & Address) having our Head Office at _____ (address) (hereinafter referred to as "Bank") in favour of Andhra Pradesh State FiberNet Limited NTR Administrative Block, 3rd Floor, Pandit Nehru Bus Station, NH -65, Vijayawada – 520013 India (hereinafter referred to as "Beneficiary") for an amount not exceeding Rs. _____/- (Rupees _____ Only) as per the request of M/s. _____ having its office address at _____ (hereinafter referred to as "Bidder") against TENDER reference _____ dated ___/___/___ of M/s. Andhra Pradesh State FiberNet Limited (APSFL). This guarantee is issued subject to the condition that the liability of the Bank under this guarantee is limited to a maximum of Rs. _____ /- (Rupees _____ Only) and the guarantee shall remain in full force up to _____ (date) and cannot be invoked otherwise by a written demand or claim by the beneficiary under the Guarantee served on the Bank before _____ (date).

ANDWHEREAS it has been stipulated by you in the said ORDER that the Supplier shall furnish you with a Bank Guarantee by a Scheduled/Nationalized Bank for the sum specified therein as EMD towards bid submission.

ANDWHEREAS we have agreed to give the Bidder a Guarantee.

THEREFORE, we (Bankers address), hereby affirm that we are Guarantors and responsible to you on behalf of the Bidder for Rs. _____/- (Rupees_____ Only) and we undertake to pay you, upon your first written demand without any demur, cavil or argument, any sum or sums within the limit of Rs. _____/- (Rupees_____ Only) as aforesaid, without your needing to prove or show grounds or reasons for your demand or the sum specified therein. We will pay the guaranteed amount notwithstanding any objection or dispute whatsoever raised by the Bidder.

This Guarantee is valid until_____.

Place:

Date:
(Bank)

Signature and seal of Guarantors

Annexure II- Performance Bank Guarantee Format

(To be submitted by the successful bidder on Rs.100/- stamp paper)

In consideration of APSFL (“Authority”), having agreed to accept from _____ “successful bidder”, a Performance Bank Guarantee as maybe modified from time to time wherever necessary under the terms and conditions of the Agreement entered into by the said successful bidder in respect of work _____, TENDER No. _____ under APSFL for the due fulfilment of the terms and conditions of the said Agreement under APSFL, on production of a Bank Guarantee for Rs.____ (Rupees _____ only), we “Bank”_____ branch, hereby undertake the guarantee to pay immediately to APSFL, on demand in writing by APSFL, an amount of Rs. _____ (Rupees_____) without any reservation and recourse against any loss or damage caused to or suffered by APSFL by reason of any breach by the successful bidder of any of the terms and conditions of the said agreement under the said Authority.

We _____ Bank, further agree that the guarantee hereby contained shall remain in full force and effect during the period that will be taken for the performance of the said Agreement under the APSFL and that it shall be in enforcement until all the dues of APSFL under or by virtue of the said Agreement under the APSFL have been fully paid and their claims satisfied or discharged or until the said Authority certifies that the terms and conditions of the said Agreement under the APSFL have been fully and properly carried out by the successful bidder and accordingly discharges the guarantee subject. This bank guarantee is valid till _____ (date) and APSFL shall have no rights under this guarantee after _____ (date).

We _____ Bank, lastly undertake not to revoke this guarantee during its currency except with the previous consent of the APSFL in writing.

Dated _____ day of _____ 2018.

Place:

Date:

Signature and seal of Guarantors (Bank)

Annexure III – Price Bid Form

(To be submitted by Bidder on original letterhead)

To

Date:

The Managing Director,
Andhra Pradesh State FiberNet Limited,
3rd Floor, NTR Administrative Block,
Pandit Nehru Bus Station,
NH – 65, Vijayawada – 520013

Subject:RFP for

Price Bid

S No	Item description	UOM	Qty (Q)	Unit Price per (P)*	Total Price (Q*P)
1	Supply, Installation of Supply of 24 Core Optical Fiber Under Ground Cable as per specification	Meters	6500		
2	HDPE Duct	Meters	12500		
3	Joint Enclosures	Nos	4		
4	Manhole	Nos	12		
6	Warning Tape	Meters	6000		
7	Route Markers	Nos	12		
	Total (A)				
	O&M (B)	Years	5		
Total (INR) (A+B)					
Total (in words)					

Note

- Unit Rate shall include all duties, levies, insurance, transport and other charges excluding Taxes.
- The Bidder offering the **Lowest Grand Total Cost (Exclusive of Taxes)** will be considered for award of contract.
- If there is a discrepancy between words and figures, the amount in words shall prevail.
- For additional procurement if any, the prices quoted for the mentioned items would be considered as discovered prices valid for the Three year period.
- Quantities indicated herein are for price discovery, actual requirement could be more or less. Hence payment will paid on actuals.

APSFL reserves the right to

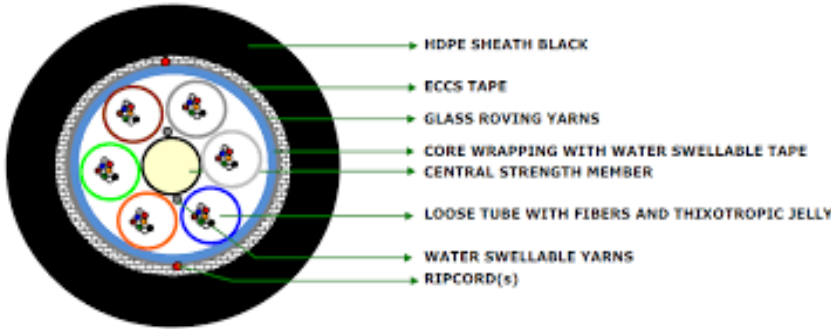
1. Negotiate with the Bidder whose offer is the lowest (L1) for further reduction of prices.
2. Ask other bidders to match the price of L1 to declare them as the shortlisted bidders and issue the order in case L1 defaults in performance of agreed terms and conditions.
3. Modify, reduce or increase the quantity requirements to an extent of the tendered quantity
4. Change the list of areas of work from time to time based upon the requirement of the purchase.
5. If delivery performance of the Bidder is not as per the Schedule, then APSFL reserves the right to take action against them.
6. APSFL reserves its right to withhold any amount for the deficiency in the service aspect of the ordered items supplied.

(Signature, name and designation of the authorized signatory)

(Name and seal of the firm)

Annexure IV – Technical Specifications

24F Armoured Underground Optical Fiber Cable



S.No.	Parameter	Unit	Value
1	No. of tubes for 24F Optical Fiber Cable:		6
2	No. of Fibers per tube for 24F Optical Fiber Cable		4
3	Fiber color		Blue,Orange,Green,Brown,Slate, White
4	Diameter of Cable 24FCable(mm):	(mm):	14.5±0.5
5	Core Diameter	µm	8.3
6	Cladding Diameter	µm	125±1
7	Cladding non-circularity	%	≤1
8	Mode Field concentricity error	µm	≤0.6 (Nominal 0.25)
9	Attenuation (Fiber)	dB/Km	
	@1310		≤0.350
	@1550		≤0.210
	@1625		≤0.240
10	Attenuation (Cabled)	db/Km	
	@1310		≤0.350
	@1550		≤0.210
	@1625		≤0.240
11	Chromatic dispersion	Ps/nm.km	
	In 1288-1339		≤3.50
	In 1270-1360		≤5.3
	@1550		18
12	PMD @ 1310 & 1550 Cabled	Ps/sq.root km	
	Individual fiber		≤0.2 (Nominal 0.1)
	Link design value		≤0.1
13	Zero Dispersion slope	Ps/(nm ² .km)	≤0.092

14	Water peak at 1383+3 nm	Db/km	≤1.0 (Nominal 0.5)
	Water peak at 1385 nm	Db/km	≤0.310
15	Zero Dispersion Wave Length	Nm	1300-1324
16	Point Discontinuity	Db	≤0.05 at 1310, 1550 & 1625
17	Fiber Cut-Off	Nm	≤1320 (Nominal 1280)
	Cable Cut-Off		≤1260
18	Attenuation Vs Wavelength		Ref λ are 1310 & 1550 nm

Pre-cast RCC chamber

Making NP 3 HD20 class circular (as per IS 458:2003) manhole/hand hole for loop and joint chambers of size (990 mm Outer diameter / 800 mm inner diameter) with 95 mm thickness at every Cable pulling & jointing location for housing the OF Cable loop & joint closure. The concrete shall be M20 and reinforcement shall be FE 415 grade. The manhole cover shall be made of 100 mm thick reinforced concrete with 2 no's lifting hooks. 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, the manholes shall be placed 600 mm below NGL in case of normal soil and at least 300 mm below hard rock areas. The MH cover shall be engraved with "APSFL OFC" with engraving depth of 10mm.