

SHOPPING FOR GOODS

REQUEST FOR QUOTATION (RFQ)

For

“ADSS and Aerial Optic Fiber Extension Work to New Nubi CC, ILCS College at Trongsa, JNE College in Dewathang, Langthel, 5 Community Centres(CC)s and CNR college at Lobesa”

VILLAGE NETWORK & DRUKREN

SASEC Information Highway Project



Royal Government of Bhutan

**Department of Information Technology & Telecom (DITT)
Ministry of Information & Communications
Thimphu Bhutan**

April 2016

Project Title: **SASEC Information Highway Project**

Source of Funding: **ADB**
Contract Ref: **0098-BHU (SF)**

Date of Issue of Request: **11th April 2016**

To: -----

Dear Sir/Madam:

1. You are hereby requested to submit price quotation/bid for the supply of ADSS and Aerial fiber optic cable, fittings & accessories and Services.
2. You are required to quote for all the items under this request. Price quotations will be evaluated for all the items together and contract awarded to the firm offering the lowest evaluated total cost of all the items.
3. You shall submit one original of the Price/Bid Quotation with Form of Bid, and clearly marked “**Original**”. Your quotation/bid in the attached format should be sealed in an envelope and addressed and delivered to the following address:

Purchaser’s Address: **Director, DITT**
P.O Box 482, Thimphu, Bhutan
Telephone: **+975-2-323215**
Fax: **+975-2-328440**

4. Your quotation in duplicate and in English language should be accompanied by adequate technical documentation and catalogue(s) and other printed material or pertinent information (in English language) for each item quoted.
5. The deadline for receipt of your quotation (s) by the Purchaser at the address indicated in Paragraph 3 is: **25 April 2016, 2:30 PM (BST). Opening will be on the same day at 3:00 PM (BST) in New DITT conference hall.**
6. Your quotation/bid should be submitted as per the following instructions and in accordance with the attached Contract. The attached Terms and Conditions of Supply is an integral part of the Contract.
7. **PRICES:** The prices should be quoted for supply, delivery and services of ADSS/Aerial optic fiber cable and extension work to the New Nubi CC, ILCS College at Trongsa, Jigme Namgyel

Engineering College in Deothang, Langthel (Yurmoo SS to BT BTS),5 CCs and CNR College at Lobesa. Prices shall be quoted in the local currency (Ngultrum) in figure and words.

8. EVALUATION OF QUOTATIONS/BIDS: Offers determined to be substantially responsive to the technical specifications will be evaluated by comparison of their prices. In evaluating the quotation/bid, the Purchaser will determine the evaluated price for each proposal by adjusting the price quotation to correct any arithmetical errors as follows:
- where there is a discrepancy between amounts in figures and in words, the amount in words will govern;
 - where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern;
 - if a Supplier refuses to accept the correction, his quotation will be rejected.
 - if any item is not quoted, for evaluation purpose the highest quote for the missing item received from other bidders will be used.
 - Non-compliance to RFQ will result in rejection of bids.
9. AWARD OF PURCHASE ORDER: The award will be made to the bidder offering the lowest evaluated price and that meets the technical requirements. The successful bidder will sign a Contract as per attached form of contract and terms and conditions of supply.

Further information can be obtained from:

Mr. Sonam Phuntsho/Mr. Sonam Jamtsho/ Mr. Tshering Wangchuk/ Ms. Thaye Choden

Telephone: +975-2-323215

Fax: +975-2-328440

E-mail: sjamtsho@dit.gov.bt/twangchuk@dit.gov.bt/tchoden@dit.gov.bt

10. Under ADB's Anticorruption Policy bidders shall observe the highest standard of ethics during the procurement and execution of such contracts. ADB will reject a proposal for award, and will impose sanctions on parties involved, if it determines that the bidder recommended for award or any other party, has engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, the Contract.

Sincerely,



(Sonam Phuntsho)
Offtg. Director

FORM OF CONTRACT

THIS AGREEMENT number _____ made on _____, ____ 2016, between _____ (hereinafter called “the Purchaser”) on the one part and _____ (hereinafter called “the Supplier”) on the other part.

WHEREAS the Purchaser has requested for quotation for _____ (description of goods) to be supplied by Supplier, viz. Contract _____, (hereinafter called “Contract”) and has accepted the Bid by the Supplier for the supply of goods under Contract at the sum of _____ (_____) hereinafter called “the Contract Price”.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The following documents shall be deemed to form and be read and construed as part of this agreement, viz:
 - a) Request for Quotation; Terms and Conditions of Supply, Technical Specification;
 - b) Addendum (if applicable);
 - c) Quotation/Bid of the Supplier;
 - d) Amendments (if any).
2. Taking into account payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby concludes an Agreement with the Purchaser to execute and complete the supply of goods under the Contract and remedy any defects therein in conformity with the provisions of the Contract.
3. The Purchaser hereby covenants to pay, in consideration of the acceptance of Contract, supply and delivery of the goods and remedying of defects therein, the Contract Price in accordance with Payment Conditions prescribed by the Contract.

IN WITNESS whereof the parties hereto have executed the Contract under the laws of Bhutan on the date indicated above.

Signature and seal of the Purchaser:
FOR AND BEHALF OF

Signature and seal of the Supplier:
FOR AND BEHALF OF

Name of Authorized Representative

Name of Authorized Representative

TERMS AND CONDITIONS OF SUPPLY

Project Name: **SASEC Information Highway**. Purchaser: **DITT, MoIC**

Consignee: _____ Package No. _____

1. Employer's Requirement, Bill of Quantities and Specifications for ADSS is given in *annexure – I-Scope of Work*.
2. **Fixed Price:** The prices indicated above are firm and fixed and not subject to any adjustment during contract performance.
3. **Completion Schedule:** The delivery, installation and commissioning at designated sites should be completed as per above schedule but not exceeding **75 days** from the date of signing of contract.
4. **Applicable Law:** The Contract shall be interpreted in accordance with the laws of Bhutan.
5. **Resolution of Disputes:** The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute between them under or in connection with the Contract. In the case of a dispute between the Purchaser and the Supplier, the dispute shall be settled in accordance with the provisions of the arbitration law or rules of Bhutan.
6. **Pre-Delivery Requirements:** The Supplier shall ensure that the supplied items are as per the technical catalogue submitted in the quotation/bid in order to ensure that the supplied items are as per the quoted items. The supplier shall submit documentary proof at least one week before the arrival of the goods.
7. **Performance Security:** The supplier shall furnish the Performance Security within twenty-one (21) days of the receipt of notification of award from the Purchaser, using for that purpose the Performance Security Form as per the attached form or another form acceptable to the Purchaser. The Performance Security shall be 10% of the Contract Amount and shall be furnished within 21 days of signing of the Contract. The Performance Security shall be only released upon completion of work. The Performance Security shall be reduced to 5 percent (5%) of the Contract to cover the Supplier's warranty obligations
8. **Payment Terms:**
 - (i) *Advance Payment:* Ten percent (10%) of the contract price within 28 days of signing the contract. Payment shall be made provided the Supplier presents a request for payment accompanied by an Advance Payment Security in the form of a bank guarantee for an amount equal to the amount of the payment, and that shall be valid

until the Goods are delivered. The supplier shall use the attached Bank Guarantee Form or any other form acceptable to the purchaser.

(ii) *On Delivery*: Seventy Percent (70%) of the total amount of the goods supplied within 45 days upon submission of invoice

(iii) *On Acceptance*: Remaining payment shall be made within 28 days upon completion of the work and submission of claim supported by the acceptance certificates issued by the Purchaser.

9. **Warranty**: Goods offered should be covered by manufacturer's warranty for at least 12 months from the date of delivery.
10. **Packaging and Marking Instructions**: The Supplier shall provide standard packing of the Goods as required preventing their damage or deterioration during transit to their final destination, as indicated in the Contract.
11. **Defects**: Within warranty period all defects will be corrected by the Supplier without any cost to the Purchaser within **15 days** from the date of notice by Purchaser. Any item found defective or not functioning properly will be returned and delivered to the suppliers premise and within 15 days the defective item shall be replaced. Failure to replace the defective item within the stipulated time will result in deduction from the performance security.
12. **Liquidity Damage**: Applicable rate for liquidated damages is one-half percent (0.5%) per week of the total contract price. Maximum deduction for liquidated damages shall not exceed 10% of the Contract Price.
13. **Force Majeure**: The supplier shall not be liable for penalties or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

For purposes of this clause, "Force Majeure" means an events beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but not restricted to, act of Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by Force Majeure event.

14. **Documents required for submission:** The bid proposal for submission to the purchaser shall comprise of the following:

SN	List of Documents to be submitted
1	Compliance to terms & conditions and specifications
2	Form of Quotation/Bid duly filled
3	Valid Trade License
4	Tax Clearance Certificate
5	Bid Security

15. **Failure to Perform:** The Purchaser may cancel the Agreement if the Supplier fails to deliver the Goods, in accordance with the above terms and conditions, in spite of a 21-day notice given by the Purchaser, without incurring any liability to the Supplier.
16. **Supply and Services completion report submission:** Upon completion of the supply and services a **report** shall be submitted to the purchaser.
17. **Completion Certificate:** Only on submission of supply and service completion report the purchaser will issue the project completion certificate by the purchaser.
18. **Delivery to the Site:** The supplier shall deliver the ADSS cables and accessories.
19. **Quantity:** The purchaser reserves the right to increase/decrease the quantities of item(s) mentioned in the BoQ.
20. **Bid validity:** Minimum 75 days from the date of closing of offer date. It may be extended, if required.
21. **Bid Security:** The Bidder shall furnish as part of its bid, in original form, a Bid Security. The Bid Security shall be, at the Bidder's option, in any of the following forms:
a. a bank guarantee,
b. an irrevocable letter of credit; or
c. a cashier's or certified check;
all from a reputable bank from an eligible country.
The amount and currency of the bid security shall be 2% of the total bid price. The bid security validity period shall be valid for 90 days from the date of closing of offer date.

FORM OF QUOTATION

To:
 The Director,
 Department of Information Technology & Telecom,
 Ministry of Information & Communications,
 Royal Government of Bhutan.
 Thimphu: Bhutan.

We offer to execute the “**ADSS/Aerial Optical Fiber Cable Extension Work to New Nubi CC , ILCS College at Trongsa, JNE College in Dewathang, CNR College at Lobesa, Langthel & 5 CCs**” in accordance with the Conditions of Contract accompanying this Quotation for the Contract Price of Nu..... (Figure).....(In words) We propose to complete the delivery of Goods and related services described in the Contract within **75 days** from the Date of Signing of the Contract.

Prices and Schedules for Supply and Services

SN	Particulars	Unit	Quantity	Unit Price(Nu)	Total Price(Nu)
A	Goods				
1	ADSS Cable 24 core (refer Clause 6.1 under specifications)	Km			
	a. Nubi CC		13		
	b. ILCS College		2.5		
	c. Langthel		0.7		
	d. JNE College		0.3		
2	Tension clamp with complete fitting accessories(reinforcement rod, vibration damper, downlead clamp) on HT telescopic electric pole/regular HT electric Pole	Set			
	a. Nubi CC - HT Telescopic Electric Pole		115		
	b. ILCS College- HT Electric Pole		7		
	c. Langthel		7		
3	Tension clamp with complete fitting accessories(reinforcement rod, vibration damper, downlead clamp) on LT electric pole	Set			
	a. Nubi CC		5		
	b. 5 CC		5		
	c. JNE College		2		
5	cable cross arm with fitting accessories on HT and LT poles	No.			
	a. Nubi CC		26		
	b. ILCS College		2		
6	FODP (24 Port RACK-mountable with SC-SC	No.	1		

	Adapter Plate, splicing tray with SC pigtail):				
	a. Nubi CC				
	b. ILCS College	Nos.	1		
	c. 5 CC	Nos.	5		
	d. JNE College	Nos.	1		
8	Outdoor Joint Enclosure 4 way Non-Metallic (Pole Type) with Clamp	No.			
	a. Nubi CC		7		
	b. ILCS College		1		
	c. Langthel CC		1		
	D. JNE College		1		
9	HDPE pipe for ILCS College	Km	0.1		
10	GI Pipe 1.5" 12 Feet with Union for ILCS College	Nos	5		
11	Lobesa CNR College				
	Aerial Optical Fiber Cable	2.5	Km		
	24 FIBER OPTIC SPLICE CLOSURE with Accessories & include protection sleeve:simplex, L:40mm (Aerial)	2	Nos.		
	FODP: 1 RU, 24 Fiber Splicing / Patching Modules	1	Nos		
	Heat shrinkable Sleeve	100	packet		
	OSP Pole Clamp (Straight)	50	Nos.		
	OSP Pole Clamp (Curve)	10	Nos		
	OSP Pole Band	60	Nos		
Sub- Total (A)					
B	Services				
1	Transportation, Installation & Commissioning of ADSS	Km			
	a. Nubi CC		13		
	b. ILCS College		1.5		
	c. 5 CCs		2.5		
	d. Langthel		0.7		
	e. JNE College		0.3		
2	UG ADSS fiber optic cable inclusive of transportation, trenching, refilling, and laying of cable (ILCS College)	km	1		
3	Transportation,Installation and Commissioning of Aerial Cable at Lobesa CNR College	Km	2.5		
Sub- Total (B)					
Total (A+B)					
Grand Total					

NOTE 1:

1. Tentative list of items and services are highlighted in table above. Bidder shall be responsible to conduct detailed survey to determine the exact quantity required. In case, any additional quantity of the items required for the successful implementation of the project, the same shall be provided by the bidder at no additional cost.
2. The prices quoted by the Bidder shall be fixed and taxes exempt.
3. Payment will be made as per the measurement book work carried out on actual.
4. The price should include the transportation cost up to designated sites, storage cost & project management cost.
5. Total quoted prices should be in local currency (Nu.) in figures and words
6. In case of discrepancy between Unit Price and Total derived from unit price, unit price shall prevail.

This Quotation and your written acceptance will constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Quotation you receive.

We hereby confirm that this Quotation complies with the Validity of the Quotation required by the Request for Quotation document.

Authorized Signature:

Name and Title of Signatory:

Name of Supplier:

Address : Thimphu Bhutan

Phone Number : 00975-2-

Fax Number, if any: 00975-2-.....

Annexure 1 – SCOPE OF WORK

1.

1.1 Village Network Project Background: SASEC IH Project

A village Network of Community Centres(CC's) is established under the SASEC Information Highway Project. The village Network through CC's will be the access points for the interaction with the outside world.. These CC's will also serve as an access point for the rural population to have access to G2C services being made available by the government. The SASEC project has already established connectivity to 131 CC's during phase I and 54 CC's for phase II are being connected.

The Internet connectivity at the CC's plays crucial role to determine the successful running of the centres. The DLAN shall be extended through ADSS fibre to CC to share the Internet.

SASEC Village Network component of the project has connected 195 CC's with ADSS fiber. Additional 5 on-grid CC's (Bjokha and Bardo in Zhemgang, Sangbaykha in Haa, Getana in Chukha and Silambi in Mongar) will be connected with ADSS fiber with this project proposal.

Nubi CC in Trongsa has been relocated to a new site. Old Nubi CC was connected with ADSS fiber during phase 1 Village Network Project. New Nubi CC therefore shall be connected with ADSS with this project proposal.

During the execution of ADSS extension to Langthel Gewog, there were no distribution structure going from Kewathang substation and construction of Yurmoo substation was not started and the only possible way was to string ADSS was from BT BTS till Langthel. Now that the Yurmoo substation is up, there is a missing link between Yurmoo substation to BT BTS, which shall be connected with this project proposal.

1.2 DrukREN Project Background: SASEC IH Project

The National Research and Education Network - DrukREN - will consist of a fiber-optic network using the existing OPGW will be an extension to the already established SASEC fiber network. Border Gateways are constructed in two fiber optic routes from Thimphu to Phuentsholing, and Thimphu to Gelephu. This fiber-optic network will further be extended to eastern side of Bhutan. A 10 Gigabit per second fibre optic backbone will be established interconnecting all the research and education institutes in the country.

Research and Education institutes including District Hospitals will be connected to 10 Gigabit per second fiber optic backbone. All colleges under Royal University of Bhutan (RUB), except for ILCS College in Trongsa, JNE College in Dewathang & CNR College in Lobesa are not connected fiber.

Therefore ILCS College in Trongsa, JNE College in Dewathang and CNR College in Lobesa shall be connected with ADSS with this project proposal.

2. FUNDING SOURCE

The funding for the scope of work given below shall be met through the Asian Development Bank (ADB) assisted by SASEC Information Highway Project. The administrative documentation requirement such as segregation of the Bill of material and amount of works shall be furnished by bidders.

3. SCOPE OF WORK

The contractor shall extend ADSS fiber from the best possible nearest BPC Transmission Tower/Distribution Pole/T-off Point to:

1. Nubi CC and ILCS College in Trongsa,
2. JNE College in Dewathang in Samdrup Jongkhar
3. 5 CCs: Bjokha and Bardo in Zhemgang, Sangbaykha in Haa, Getana in Chukha and Silambi in Mongar.
4. The contractor shall comply with BEA/BPC safety standards while executing the work. The contractor shall work in close consultation with the concerned BPC ESD Office.

3.1 SCOPE OF WORK FOR Nubi CC, Trongsa

- 3.1.1 Supply of ADSS cable, transportation, tapping, stringing/laying, mounting, installation, testing and commissioning on site of ADSS cable between the Nearest BPC Power Transmission Tower and Nubi CC at Trongsa;
- 3.1.2 Splicing and termination;
- 3.1.3 Sufficient cable loop for maintenance in the future shall be kept; and
- 3.1.4 Dispose off unwanted materials in a safe and environmentally friendly manner.

3.2 SCOPE OF WORK FOR ILCS College, Trongsa (BPC HT Pole Route attached as Annexure 1)

- 3.2.1 Supply of ADSS cable, transportation, tapping, stringing/laying, mounting, installation, testing and commissioning on site of ADSS cable between the Nearest BPC Power Transmission Tower in Trongsa and ILCS College in Trongsa;
- 3.2.2 Tapping and splicing/termination of pair of fiber from existing ADSS fiber connecting Drakteng Gewog and Kewathang BPC Substation, and termination of pair of fiber to the optical termination box;
- 3.2.3 The optical termination box shall be installed at one of the BPC HT Poles;
- 3.2.4 Splicing/termination;

- 3.2.5 Termination of cable to the optical termination box (FODP) at the ILCS College (ILCS IT Server Room);
- 3.2.6 The optical termination box (FODP) shall be installed inside the ILCS College in consultation with ILCS ICT Officer and shall be rack mounted;
- 3.2.7 Sufficient cable loop for maintenance in the future shall be kept; and
- 3.2.8 Dispose off unwanted materials in a safe and environmentally friendly manner.

3.3 SCOPE OF WORK FOR JNE COLLEGE IN DEWATHANG

- 3.3.1 Supply of ADSS cable, transportation, tapping, stringing/laying, mounting, installation, testing and commissioning on site of ADSS cable between the Nearest ADSS FODP/Joint Box/T-off Point connecting Dewathang Gewog and JNE College in Dewathang;
- 3.3.2 Tapping and splicing/termination of pair of fiber from existing ADSS fiber connecting Dewathang Gewog and Dewathang BPC Substation, and termination of pair of fiber to the optical termination box (if required); Contractor shall splice/patch fiber connecting JNE College and Dewathang BPC SS with a pair of OPGW fiber from Pemagatshel Nangkhon BPC SS at Dewathang BPC SS;
- 3.3.3 The optical termination box shall be installed at one of the BPC HT Poles if required;
- 3.3.4 Splicing/termination;
- 3.3.5 Termination of cable to the optical termination box (FODP) at the JNE College (JNE IT Server Room);
- 3.3.6 The optical termination box (FODP) shall be installed inside the JNE College in consultation with JNE ICT Officer and shall be rack mounted;
- 3.3.7 Sufficient cable loop for maintenance in the future shall be kept; and
- 3.3.8 Dispose off unwanted materials in a safe and environmentally friendly manner.

3.4 SCOPE OF WORK FOR 5 CCs

- 3.4.1 Transportation of ADSS cable, tapping, stringing/laying, mounting, installation, testing and commissioning on site of ADSS cable between the Nearest BPC Power Transmission Tower and CCs
- 3.4.2 Splicing and termination;
- 3.4.3 ADSS cables will be provided by the Department of IT and Telecom. The Contractor shall test before installation of the ADSS cables;
- 3.4.4 Sufficient cable loop for maintenance in the future shall be kept; and
- 3.4.5 Dispose off unwanted materials in a safe and environmentally friendly manner.

3.5 SCOPE OF WORK for Yurmoo substation to BT BTS

- 3.5.1 Supply of ADSS cable, transportation, tapping, stringing/laying, mounting, installation, testing and commissioning on site of ADSS cable between the Yurmoo substation and BT BTS;
- 3.5.2 Splicing and termination;
- 3.5.3 Sufficient cable loop for maintenance in the future shall be kept; and
- 3.5.4 Dispose off unwanted materials in a safe and environmentally friendly manner.

3.6 SCOPE OF WORK FOR LOBESA CNR COLLEGE

- 3.6.1 Supply of aerial optical fiber cable, transportation, tapping, stringing/laying, mounting, installation, testing and commissioning on site of cable between the Wangdi BT to RNR JB.
- 3.6.2 Tapping and splicing/termination of fiber from existing BT Aerial fiber connecting RNR JB and CNR College in Lobesa, and termination of fiber to the optical termination box (if required); Contractor shall splice/patch fiber connecting CNR College and Wangdue BT PoP at RNR JB;
- 3.6.3 Splicing and termination;

3.6.4 24 FIBER OPTIC SPLICE CLOSURE, with Accessories shall be installed on the existing OSP Pole (Aerial optic fiber cable comes in 1 km (maximum) in length)

3.6.5 Sufficient cable loop for maintenance in the future shall be kept; and

3.6.6 Dispose off unwanted materials in a safe and environmentally friendly manner.

4. OTHER TERMS & CONDITIONS

- a. The payment to the Supplier shall be made as per the payment terms as stipulated in the Terms and Conditions;
- b. Provide complete test results of the fiber – *Optical power, fiber losses and bandwidth /dispersion*

5. SUBMISSION OF ADSS FIBER TEST RESULT SCHEDULE

The Supplier shall submit on completion of the work the following:

- a. Test results upon completion of fiber link.

6. SPECIFICATIONS

A. ADSS SPECIFICATIONS

S N	Parameters	Unit	Particular/Description
1	No. Of Fibres DWSM (Dual Window Single Mode)	Nos.	24F
2	Type of Fiber		Single Mode, ITU-T G652D
3	Strength Member		Aramid yarn
4	DWDM optical color		Blue, orange, green and natural
5	Overall diameter of the cable	mm	14 mm, ± 0.5 mm
6	Overall weight of the cable	Kg	165 ± 20 Kg/Km
7	Minimum bend radius	mm	280 mm
8	Tensile strength	KN	12 KN
9	No. Of Fibers per tube	Nos.	6

10	Operating temperature		-30 ° C to + 70 ° C
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B. ADSS OPTICAL PARAMETERS

S N	Parameters	Unit	Particular/Description
1.	Attenuation Coefficient		
2.	@ 1310 nm	dB/km	≤ 0.35
3.	@ 1550 nm		≤ 0.23
4.	Mode field diameter	μm	9.2
5.	Deviation in mode field diameter	μm	± 0.5
6.	Attenuation variation with wavelength (± 25 nm) Temperature	dB/km	± 0.05
7.	Mode field non-circularity	%	6
8.	Chromatic Dispersion		
	@ 1310 (1288 - 1339)nm	ps/nm ² km	3.5
	@ 1310 (1271 - 1360)nm		6
	@ 1550nm		20
9.	Zero dispersion wavelength	nm	1300 - 1324
10	Zero dispersion slope	ps/nm ² km	≤ 0.092
11	Refractive index		1.47
12	Refractive index profile		Step Index
13	Cladding design		Matched
14	Numerical aperture		0.1
15	Bandwidth distance product	MHz km	NA
16	Bend Performance (37.5 mm radius, 100 turns)		< 0.05 dB

C. AERIAL OPTICAL FIBER CABLE SPECIFICATIONS (FOR LOBESA CNR COLLEGE)

S N	Parameters	Unit	Particular/Description
1	No. Of Fibres	Nos.	24F
2	Type of Fiber		Single Mode, G652D
3	Maximum Attenuation		0.4 dB/km / 0.4 dB/km / 0.3 dB/km
4	No. of Fiber per Tube		6
5	Diameter of the wire	mm	1.8
6	Outer Diameter	mm	9
7	Central Member	mm	1.4
8	Self-supporting wire Count	Nos	7
9	Ripcord materials Plastic Thread(s)	Nos	2
10	Operating temperature		-30 ° C to + 70 ° C

C. 24 FIBER OPTIC SPLICE CLOSURE (For Lobesa CNR College)

- Simplex
- L:40mm
- Feeder / Distribution=2/4,
- Splice capacity per tray=12C,
- No. of splice tray=4,
- Max. Capacity= 24 C,
- Installation type=Aerial

D. FODP (For Lobesa CNR College)

- 24 Fiber Splicing / Patching Modules
- Dimensions(Width X Depth X Height) :200mm X 30mm X 125mm (7.87” X 1.18” X 4.92”),
- Fiber Capacity=24 ,
- Unit-1U,

- Number of Splice Tray=2,
- Splice Tray Capacity=24,
- Provides excellent fiber cord management ,
- Rear mounts into a 19” rack, complete with hinged front cover that houses a record card, patch panel types SC with thru adaptors & pigtails & H/Shrinks with Splice Trays

E. HEAT SHRINKABLE SLEEVE

- Protection sleeve:simplex,
- L=40mm,
- standard colour
- 100 pieces per packet

FORM OF BID SECURITY: BANK GUARANTEE

..... *Bank's Name and Address of Issuing Branch or Office*.....

Beneficiary: *Name and Address of Employer*

Date:.....

Bid Security No.:

We have been informed that *name of the Bidder*. (hereinafter called "the Bidder") has submitted to you its bid dated (hereinafter called "the Bid") for the execution of *name of contract* under Invitation for Bids No. ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we *name of Bank*. hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *amount in figures* (. *amount in words*) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or
- (b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or
- (c) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of the Bidder's bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

.....*Bank's seal and authorized signature(s)*.....

Note: *All italicized text is for use in preparing this form and shall be deleted from the final document*

Annexure 1: ILCS College, Trongsa (BPC HT Pole Route)

