South Hadley Electric Light DEPARTMENT

INVITATION FOR BIDS

South Hadley Electric Light Dept "SHELD"

2019 Fiber Optic Cable & Connectivity Bid *#2019-4D*

Sealed bids for Fiber Optic Cable & Connectivity will be received at the SHELD MLP main lobby of the South Hadley Electric Light Dept, 85 Main Street, South Hadley, MA 01075 until the time specified below at which time the bids will be publicly opened and read.

Specifications and bid forms may be obtained at the Office of the South Hadley Electric Light Department, Monday through Friday between 9:00 am and 4:00 pm. The term of this contract is through December 31, 2019, with an option for SHELD to extend the contract for one year. Please include pricing for an additional year.

Bidders are to submit three (3) copies of each sealed bid to the Office of the General Manager before **10:00 A.M., on Wednesday, March 27, 2019.**

Bids must be on the South Hadley Electric Light Department **Bid Form** for Fiber Optic Cable & Connectivity and *must be accompanied by the signed "Certification of Signature Sheet".*

Please mark envelopes: "***2019 Fiber Optic Cable & Connectivity Bid #2019-4D".***

Proposals will be opened in consecutive order commencing at **10:00 A.M. on Wednesday March 27, 2019**. No fax or electronic bids will be accepted. All bids must be clear and legible in order to be considered.

For any technical questions or concerns regarding the Bid, please e-mail Bobby Liswell at bliswell@sheld.org . The Invitation to Bid is also available on our website: www.sheld.org, under "About", "RFP and Specifications". If you would prefer to have the bid package emailed to you, please contact Kim at kmendoza@sheld.org.

The Municipal Light Board reserves the right to reject any or all bids that are not in the best interest of the Department.

Sean Fitzgerald, General Manager
South Hadley Electric Light Department
85 Main Street
South Hadley, MA 01075

South Hadley Electric Light DEPARTMENT

SOUTH HADLEY ELECTRIC LIGHT DEPARTMENT

TERMS AND CONDITIONS

FOR 2019 FIBER OPTIC CABLE & CONNECTIVITY

The Terms and Conditions listed below may or may not apply to this procurement.

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1. **Preparation of Bids**

These Specifications cover the Department's requirement for fiber optic cable and connectivity. The quantities of each item are the expected requirement for the term of this bid. The Department does not guarantee to purchase any minimum quantity. The Department also reserves the right to increase the purchase quantities during the term of this bid and the successful bidder agrees to maintain the unit or item price.

2. **Bid Form**

Bids will not be accepted in any other form that is not accompanied by a completely filled out Bid Form. All bids must be submitted in triplicate (original with 2 copies). Items quoted that are not in complete accordance with the Specifications must be clearly labeled as alternates and illustrations to verify their equivalency must be included.

All information, including item price and delivery date that will be used in awarding the contract(s) must be referenced on the Bid Form. Any additional information or explanation of terms may be attached, but will not supersede the Bid Form or the Department's terms and conditions.

All prices listed on the Bid Form are to be net, including any prompt payment discounts. Statements requiring group purchases will not be accepted. All bid figures will be typed and priced on a per unit basis. All prices are firm for orders issued within the period noted on the Bid Form.

Bids will be considered even if they do not include each type or style of material. All bids will be based upon an item number and awards may be made on an item basis.

3. **Delivery**

Delivery shall be at the expense of the Bidder to 85 Main Street, South Hadley, MA 01075. Deliveries are accepted Monday through Friday between 8:00 a.m. - 12:00 p.m. and 1:00 p.m. - 3:00 p.m. only. The Department is closed on Holidays. A 24-hour notice is to be given if unloading assistance is required.

4. **Guarantee**

The Bidder shall guarantee all material against defects in design, materials, and workmanship and shall also guarantee that the material shall give successful service under the required conditions.
The material shall be manufactured, tested and meet all applicable industry, Federal and State standards.

5. **Award**

The Department will make a comparison of all properly received, qualifying bids for material based upon unit price and delivery date. Bidders' attention is directed to the policy of the Department to support, whenever possible, American industries. Notification of award will be made in the form of a purchase order for a particular item. No material will be accepted until a purchase order has been issued.

All items must be received by the South Hadley Electric Light Department within the specified delivery date of the bid, ARO, unless a longer delivery time has been agreed to in advance. Excessive delivery time is a factor in the award. The Vendor shall impose no penalties for cancellation of any order that was not received by the South Hadley Electric Light Department within the specified time.

6. **Contract and Payment Terms**

The successful Bidder shall agree that the following shall constitute the entire contract:

1) The completed bid form submitted by the Vendor shall be considered the offer; and

2) The Department's purchase order for each bid item will be considered the acceptance of the Vendor's offer; and

3) The terms and conditions contained within these specifications.

4) **The term of this contract will be through December 31, 2019, with an option for SHELD to extend the contract for a one year. Please include pricing for an additional year.**

No other terms, conditions, or agreements shall be considered part of this contract unless agreed to in writing by both parties. The Department's contract shall be with the Vendor submitting the bid and not with any third party. No portion of the bids shall be sublet to any other Vendor without prior written approval of the Department.

The Department agrees to pay the Bidder in full within 30 days after delivery and acceptance of the material.

Massachusetts Tax Exempt Purchaser Certificate No. 046-001-303.

7. **Bids**

The Municipal Light Board hereby reserves and retains the right to reject any and all proposals that, in their opinion, are not in the best interest of the South Hadley Electric Light Department.

All bids (3 copies) must be submitted in a **SEALED** envelope plainly marked:

"***2019 Fiber Optic Cable & Connectivity Bid #2019-4D"***

8. **Mass. Tax Laws**

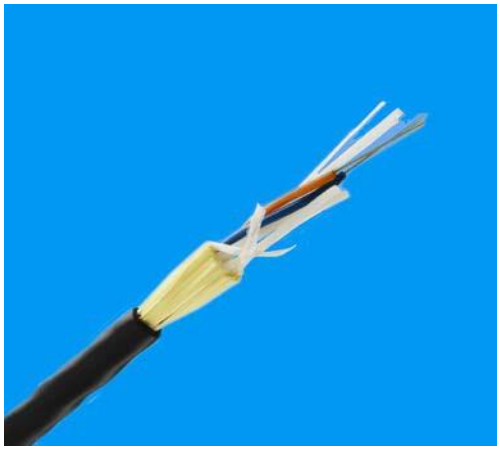
The Bidder certifies that he has complied with all Mass. Tax Laws, (CH 62C SEC 49A).

Single Jacket ADSS Loose Tube Cable Specification

1.0 General Information

This document specifies the requirements for a Single Jacket ADSS Loose Tube cable as shown in Figure 1. This cable design incorporates loose buffer tubes (gel free) that are stranded via the reverse oscillating lay method around a dielectric central strength member. The core can be made with up to 12 buffer tubes. The core is surrounded by aramid strength elements and an outer polyethylene jacket to provide resistance and overall protection. ADSS cables shall be designed to meet NESC Heavy loading conditions with 1.5% installation sag and Max spans of 300 ft.

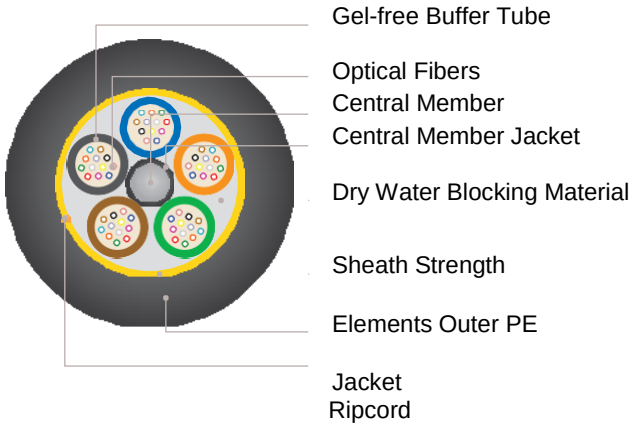
Figure 1 – Single Jacket ADSS Loose Tube Cable



2.0 Cable Design Variations

This specification covers Single Jacket ADSS Loose Tube cables with up to 12 fibers per tube containing up to 144 fibers. Figure 2 shows a cross section for these cables. Cables up to 30 fibers will contain 6 fibers per tube. Fiber counts greater than 30 shall contain 12 fibers per tube.

Figure 2 – Single Jacket ADSS Loose Tube Cable Construction



3.0 Cable Specifications

All cables must meet the requirements of *Telcordia GR-20-CORE and IEEE P1222*. Manufacturing must be performed under strict quality control standards with *ISO 9001* and *TL9000* certification. Recommended environmental temperatures ranges are specified in Table 2.

Table 2 – Recommended Environmental Temperatures

Operating Temperature	-40 to 70°C (-40 to 158°F)
Installation Temperature	-30 to 60°C (-22 to 140°F)
Storage/Shipping Temperature	-40 to 75°C (-40 to 167°F)

ADSS cables shall be supplied with a "Sag & Tension" table specifying NESC Heavy loading conditions, 300foot max span, 1.5% installation sag, dimensions, and other pertinent data. Dimensions and performance characteristics of this cable are as listed in Table 3.

Table 3 – Cable Specifications (Typical)

Fiber Count	Cable OD	Minimum Bend Radius		Unit Weight	Estimated Break Load	Maximum Span Length
	mm (inches)	Loaded *mm (inches) (15xOD)*	Unloaded *mm (inches) (10xOD)*	*lb/kft*	*lbs*	*feet*
12	11.7 (0.46)	176 (7.00)	117 (4.60)	56	1320	300
24	11.7 (0.46)	176 (7.00)	117 (4.60)	56	1320	300
48	11.7 (0.46)	176 (7.00)	117 (4.60)	56	1320	300
72	12.7 (0.50)	191 (7.50)	127 (5.00)	67	1320	300
96	14.7 (0.58)	221 (8.70)	147 (5.80)	91	1600	300
144	18.5 (0.73)	278 (11.00)	185 (7.30)	152	2239	300

NOTE - NESC Heavy loading with 1.5% installation sag.

4.0 Cable Construction

4.1 Central Strength Member

The central member functions as an anti-buckling element, and is a glass/epoxy composite dielectric rod. A polyethylene overcoat may be applied to the central member to provide the proper spacing between buffer tubes during stranding.

4.2 Buffer Tubes

The fiber buffer tubes are made of Flexible Tube Material (FTM), with an outer diameter of 2.7 - 3.0 +/- 0.1 mm. The nominal wall thickness is 1.0 mm. Each buffer tube shall contain up to 12 fibers.

Table 4 – Buffer Tubes

Fiber Count	Buffer Tube OD (mm)	Fibers per Tube
2-30	2.7 - 3.0	6
36-144	2.7 - 3.0	12

4.3 Buffer Tube Fill

Optical fibers are enclosed within buffer tubes that have a diameter several times larger than the diameter of the fibers. The optical fibers are loose within the buffer tubes allowing the fibers to move freely. The tubes shall be gel-free and utilize a super-absorbent yarn that delivers water blocking “on-demand”.

4.4 Fiber and Buffer Tube Color Code

The individual fibers and buffer tubes are color coded for ease of identification per EIA/TIA-598 (Table 5).

Table 5 – Fiber and Buffer Tube Color Code

Fiber/Tube Number	Color
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White
7	Red
8	Black
9	Yellow
10	Violet
11	Rose
12	Aqua

4.5 Filler Rods

In order to create a round cable, filler rods of the same diameter as the buffer tubes (3.0 mm) may be used to fill empty positions. Filler rods are made out of HDPE and are natural in color.

4.6 Buffer Tube Stranding

The buffer tubes (and filler rods, if necessary) are stranded in a reverse oscillation lay (ROL) or “S-Z” technique around the central member for easy mid-span access.

4.7 Cable Core Binders

The core is wrapped with two counter helically applied polyester binders to bind together the cable core. These binders may contain dry water blocking material when necessary to meet water penetration requirements.

4.8 Cable Core Water Blocking

Water blocking is accomplished via “dry” elements within the cable core. These “dry” water-blocking elements form a gel compound when in contact with water. The gel effectively fills the interstices of the core and prevents water penetration along the length of the cable. Water blocking elements, binders and/or tapes depending on the cable construction, are applied about the cable’s core and appropriate jacket materials to provide water blocking in the interstices created between the cable materials.

4.9 Strength Elements

Aramid strength elements are applied over the cable core to provide the cable with the required tensile strength. The number of ends shall be dictated by the customers required loading conditions and span lengths.

4.10 Outer Jacket

A black MDPE outer polyethylene jacket (1.4mm minimum) is applied over the cable to provide overall mechanical protection. The jacket will be continuous, free from pinholes, splits, blisters, or other imperfections. The standard MDPE polyethylene outer jacket material is suitable in applications where the electric space potential is less than or equal to 12 kV.

4.11 Ripcords

For ease of jacket removal, one clearly identifiable polyester ripcord is provided under the inner and outer jackets.

5.0 Jacket Print & Cable Packaging

5.1 Cable Length and Sheath Markings

The length shipped is equal to or greater than the ordered length. All cables have sequential length markings along the cable sheath every two feet. The cable length may be no shorter than the marked length, but may be up to 1% greater than the marked length. If the initial cable marking (white characters) fails to meet the marking requirements, the cable is remarked. The remarking is imprinted with yellow characters on a different portion of the cable sheath. Therefore, for any cable that contains two sets of cable marking, only the yellow marking should be used.

The standard cable print is "Manufacturers Name OPTICAL CABLE (product description [Part#]) (month and year of manufacture [MM- YY]) (telephone symbol [Handset Symbol]) (fiber count [XXX F]) (cable serial number)" where XXX is the number of optical fibers in the cable. Identification and sequential length marking is printed every two feet.

5.2 Cable End Fastening

To provide access for testing, the bottom end, “test tail”, shall be approximately three meters in length and easily assessable. For wooden reels the end shall be protected by protection rings and is securely fastened to the outside of the reel flange by wood screws. For plywood reels, the end shall be fed into the 2nd slot and be protected by wood lagging. Protection plates will be applied over the wooden protection rings only if required by customer.

5.3 Information Accompanying the Reel

Each cable shall have a certified test data sheet attached to the reel in a waterproof wrapping containing the following information: cable number, date, customer name, ordered length, customer order number, ship length, customer cable code, customer reel number, customer attenuation specification(s), number of fibers, cable construction, fiber transmission data, bandwidth data (for multimode fibers only), and authorized signature.

5.4 Reel Tag

Each cable shall have a reel tag fastened to the reel in a waterproof wrapping containing the following information: cable number, date, customer name, ordered length, customer order number, ship length, customer cable code, customer reel number, customer’s attenuation specification(s), number of fibers, beginning and ending sequential length markings, gross weight, net weight, Inspected by signature, remarks if applicable, date of manufacture by month and year (Loose Tube Riser only), and “Type OFNR (UL)” (Loose Tube Riser only).

5.5 Pre-Shipment End Sealing

The ends of all cables are sealed to prevent the escape of filling compound and to prevent the entry of moisture during shipping, handling, storage, and installation.

5.6 Reels

Reels shipping domestically will have HDPE lagging. Each wooden reel shall be permanently marked with the following information:

- Fiber Optic Cable
- An arrow and the wording “cable end” to indicate the position of the outside cable end
- An arrow and the wording “ROLL THIS WAY” to indicate the direction the reel should be rolled
- Reel Number

The arbor hole in the flange shall have a nominal diameter of either 3 1/8” or 4 1/4” for wooden reels.

5.7 Reel Length Tolerance

The length tolerance for each reel shall be +/- 2.5%

6.0 Mechanical & Environmental Testing

Single-Mode Fibers: Per *Telcordia GR-20*, the magnitude of the attenuation change shall be less than or equal to 0.05 dB for 90% of the test fibers and less than or equal to 0.15 dB for the remaining 10% of test fibers.

Cable aging allows for 0.10 dB/km average attenuation change with a magnitude of the maximum attenuation change for each individual fiber to be less than 0.25 dB/km. These attenuation values include a 0.05 dB allowance for measurement repeatability.

During mechanical and environmental testing evidence of cracking, splitting or other failure of the sheath components when examined under 5X magnification would result in failure of the proposed test requirements. In addition, no fiber shall lose optical continuity because of the test.

Table 7 – Testing for Single Mode Fibers

Cable Test	Test Method *	Requirement	Notes
Tensile Loading and Bending	EIA/TIA-455-33 IEC 794-1-E1**	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss	1
Cyclic Flexing	TIA/EIA-455-104 IEC 794-1-E6**	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss	1
Cyclic Impact	EIA/TIA-455-25 IEC 794-1-E4**	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss	1
Compressive Loading	TIA/EIA-455-41 IEC 794-1-E3**	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss	1
Twist	TIA/EIA-455-85 IEC 794-1-E7**	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss	1
Low and High Temperature Bend	EIA/TIA-455-37 IEC 794-1-E11	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss	1
External Freezing	EIA/TIA-455-98 IEC 794-1-F6***	< 0.05 dB Mean Added Loss < 0.15 dB Max. Added Loss	1
Cable Galloping Test	IEEE P1222 Bellcore TR-NWT-001121	0.10 dB Max. Added Loss	2
Aeolian Vibration	IEEE P1222 Bellcore TR-NWT-001121	0.10 dB Max. Added Loss	2
Fiber Strip ability	EIA/TIA-455-178 No equiv IEC proc	8.9 N (2 lbf) on unaged and aged fiber 1.3N (0.3 lbf) on unaged and aged fiber	1
Temperature Cycling	EIA/TIA-455-3 IEC 794-1-F1**	0.05 dB/km Mean Added Loss 0.15 dB/km Max Added Loss	1
Cable Aging	EIA/TIA-455-3 IEC 794-1-F1**	0.10 dB/km Mean Added Loss 0.25 dB/km Max Added Loss	1
Water Penetration	EIA/TIA-455-82 IEC 794-1-F5**	No flow after 24 hours from one meter length of cable	1
Sheath-to-Ground Dielectric Strength	RUS PE-90	20 kV for all armored metallic sheaths	2
Compound Drip	EIA/TIA-455-81 IEC 794-1-E14	80C, 24 hours duration, no drip	1
Lightning Conduction	TIA/EIA-455-181 IEC***	Bellcore Category I for all armored metallic sheaths	2

Cables conforming to the requirements specified herein conform to Telcordia GR-20, Issue 2, Telcordia TR- NWT-001121, Issue 2, RDUP and IEEE P1222 specifications

7.0 Quality Control

7.1 Manufacturer

The cable manufacturer must have a continuous history of manufacturing ADSS cable for at least 15 years. Manufacturer must be *ISO 9001* and *TL9000* certified.

7.2 Reel Testing

Each master reel will be tested to ensure fiber integrity, attenuation, and cable length. Multimode fibers will be tested at both 850 and 1300 nm. Single mode fibers will be tested at both 1310 and 1550 nm. Each master reel will be given a unique identification and the test results documented. The manufacturer maintains documentation such that the cable history may be traced to the individual fibers used in construction of the cable.

7.3 Certified test Data

Each cable shall have a certified test data sheet attached to the reel in a waterproof wrapping containing the following information: Manufacturers Name, cable number, date, customer name, ordered length, customer order number, ship length, customer cable code, customer reel number, customer attenuation specification(s), number of fibers, cable construction, fiber transmission data, bandwidth data (multimode fibers only), and authorized signature

8.0 Single Mode Zero Water Peak ADSS Cabled Fiber Specifications

This section provides recommended cabled Zero Water Peak fiber specifications for ITU-T G.652 D and G.657.A1 single-mode fiber in Loose Tube ADSS Cable constructions.

8.1 Standards References

8.1.1 The Optical Fiber shall meet or exceed the national and international standards for single-mode fiber described in the table below.

Table 1 – Optical Fiber Standards

Standard	Designation	Description
ITU-T	G.652D; G.657.A1	extended wavelength band
IEC 60793-2-50	B1.3	extended wavelength band
TIA-492-CAAB	Type IVa	dispersion-unshifted with reduced water peak

8.1.2 The Optical Fiber shall be referenced in the national and international standards for applications utilizing single-mode fiber described in the table below.

Table 2 – Application Standards

Standard	Description	Optical Fiber Reference(s)
IEEE 802.3	Ethernet for Subscriber Access Networks. (Includes both PON and point to point applications)	IEC 60793-2-50 B1.3
ITU – G.983.3	Broadband Passive Optical Network (BPON)	ITU-T G.652D; G.657.A1
ITU – G.984.2	Gigabit Capable Passive Optical Network (GPON)	ITU-T G.652D; G.657.A1

8.2 Fiber Material

8.2.1 The Optical Fiber shall be comprised of ***100% synthetic silica***. Natural Quartz shall not be used in any proportion of the fiber core or cladding.

8.3 Optical Fiber – Approved/Acceptable Products & Specifications

8.3.1 ***OFS Allwave + ZWP and/or Corning SMF-28e+*** *(Note – Any other optical fibers quoted must meet all the specifications defined below & detailed specifications sheets indicating compliance must be provided with the quotation)*

8.3.2 Optical Fiber Parameters – Minimum Performance Values

8.3.2.1 Core Diameter – 8.3 microns
8.3.2.2 Cladding Diameter – 125 $\pm$ .7 micron
8.3.2.3 Protective Coating Diameter – 240 $\pm$ 7 microns
8.3.2.4 Numerical Aperture – 0.13 $\pm$ 1
8.3.2.5 Core/Cladding Concentricity Offset – $\leq$ 0.5 microns
8.3.2.6 Max Attenuation at 1310 nm – 0.35 dB/km
8.3.2.7 Max Attenuation at 1550 nm – 0.25 dB/km
8.3.2.8 Max Attenuation at 1625 nm – 0.24 dB/km (bare fiber) / .027 dB/km (Cabled)
8.3.2.9 Induced Attenuation due to fiber wrapped around a 50 mm diameter mandrel for 100 turns at 1310 nm and 1550 nm shall not be greater than 0.05 dB.
8.3.2.10 Attenuation vs. Wavelength
- Attenuation in 1285 – 1330 nm $\leq$ 0.05 dB/km greater than the attenuation at 1310 nm
- Attenuation in 1525 – 1575 nm $\leq$ 0.05 dB.km greater than the attenuation at 1550 nm

8.3.2.11 Attenuation Uniformity – No loss discontinuities > 0.07 dB at 1310, 1550 or 1625 nm
8.3.2.12 Mode Field Diameter (1310 nm) – 9.4 $\pm$ 0.4 microns
8.3.2.13 Mode Field Diameter (1550 nm) – 10.4 $\pm$ 0.5 microns
8.3.2.14 Chromatic Dispersion
- 1285 – 1330 nm – $\leq$ 3.5 ps/nm•km
- 1500 – 1550 nm – $\leq$ 20.0 ps/nm•km

8.3.2.15 Nominal Zero Dispersion Wavelength – 1312 $\pm$ 10 nm
8.3.2.16 Maximum Zero Dispersion Slope – $\leq$ 0.092 ps/(nm^2•km)
8.3.2.17 Cutoff Wavelength – $\leq$ 1260 nm
8.3.2.18 Polarization Mode Dispersion – PMD Link Design Value of $\leq$ 0.06 ps/km$^{1/2}$; Maximum Individual Fiber of $\leq$ 0.2 ps/km$^{1/2}$

8.3.3 The Optical Fiber shall meet the Environmental specifications listed below.

Operating Temperature	-60° C to +85° C
Temperature Dependence of Attenuation Induced attenuation at 1310, 1550, & 1625 nm at -60° C to +85° C	≤0.05 dB/km FOTP 3
Temperature – Humidity Cycling Induced attenuation at 1310, 1550, & 1625 nm at –10 - 85° C at 95% RH	≤0.05 dB/km FOTP 72
Water Immersion, 23°C Induced attenuation at 1310, 1550, & 1625 nm due to water immersion at 23 ± 2° C	≤0.05 dB/km FOTP 75
Accelerated Aging (Temperature), 85° C Induced attenuation at 1310, 1550, & 1625 nm due to temperature aging at 85 ± 2° C	≤0.05 dB/km FOTP 67
Full Spectrum Testing & Performance Assurance	

Mechanical & Environmental Characteristics of Optical Fiber in Loose Tube Cable

Testing Standard	
EIA/TIA-3A	Temperature Cycling/Cable Aging
EIA/TIA-25B	Impact Resistance
EIA/TIA-33A	Tensile and Bend Test
EIA/TIA-37A	Low/High Temperature Bend Test
EIA/TIA-41A	Compressive Strength
EIA/TIA-81	Compound Flow Drip Test
EIA/TIA-82B	Fluid Penetration
EIA/TIA-85A	Cable Twist
EIA/TIA-98	Fiber Optic Cable External Freezing Test
EIA/TIA-104A	Flex Test

For all mechanical & environmental tests, the magnitude of the attenuation change at 1550nm shall be less than or equal to 0.05 dB for 90% of the test fibers and less than or equal to 0.15 dB for the remaining 10% of the test fibers. These attenuation values include a 0.05 dB allowance for measurement repeatability.

Operating Temperature Range in Loose Tube Cable

Cable Operating Temperature Range	-60° C to +70° C

8.3.4 The Optical Fiber shall meet the Mechanical specifications listed below.

Proof Test Level	0.7 Gpa (100 kpsi)
Dynamic Tensile Strength (aged and unaged) The median tensile strength of samples with a 0.5 meter gauge length is:	≥3.8 Gpa(550 kpsi)
Coating Strip Force (aged and unaged) The force to mechanically strip the dual coating is:	≥1.3 N (0.3 lbf.) and < 8.9 N (2.0 lbf.)

8.3.5 The Optical Fiber shall meet the other specifications listed below.

Effective Group Index of Refraction 1310 nm 1550 nm	 1.466 ± 0.001 1.467 ± 0.001
Dynamic Fatigue Parameter (N_d)	>20
Rayleigh Backscattering Coefficient (for 1 ns pulse width) 1310 nm 1550 nm	 -78.3 ± 1.3 dB -82.1 ± .1 dB

9. SHIPPING AND DELIVERY

Materials shall be delivered 85 Main Street, South Hadley, MA 01075 during normal business hours with 24 hour notice. All reels shall be properly packaged to prevent damage during shipping and handling.

10. INFORMATION TO BE SUBMITTED

All bids must be submitted with a completed SHELD Bid Form, technical data detailing the cable that the Bidder proposes to furnish, written exception, if any, to the Specifications or Proposal documents and any additional information as may be requested on the Bid Proposal Form or that may be useful in evaluation the submitted bid.

11. BID EVALUATION

In evaluating the quotations, the following factors will be considered: Quoted Price, Quoted Delivery, Physical Characteristics, and previous experience with the Manufacturer, previous experience with the Bidder and overall compliance with the Specifications and other Proposal documents.

South Hadley Electric Light
DEPARTMENT

CERTIFICATION OF SIGNATURE SHEET

The undersigned hereby certifies that under the penalties of perjury that his bid is in all respects bonafide, fair and made without collusion or fraud with any other person. As used in the subsection, the word "person" shall mean any natural person, joint venture, partnership, corporation or any other business entity.

The undersigned further certifies that under pains and penalty of perjury that to the best of my knowledge and belief, the vendor/contractor has filed all state tax returns and paid all state taxes required under law and has complied with all laws of the Commonwealth of Massachusetts relating to taxes.

COMPANY NAME AND ADDRESS: _____

_____

_____

_____

TELEPHONE AND FAX NUMBER: _____

FEDERAL I.D. NUMBER: _____

DATE: _____

_____
Signature of Corporate or Company Officer

_____
Print Name

_____
Email Address

IF THE REMIT ADDRESS IS DIFFERENT THAN THE ADDRESS TO WHERE THE PURCHASE ORDERS ARE MAILED, PLEASE ENTER BELOW:

Remit to: _____

_____

_____

_____

Approval of this contract will not be granted unless this certificate clause is signed by the applicant. This request is made under the authority of Mass. G.L. c. 62C S. 49A.

South Hadley Electric Light DEPARTMENT

BID FORM - PRICING ADSS TYPE CABLE:

ITEM	ITEM DESCRIPTION	QTY.	UNIT PRICING ($/FT)	TOTAL PRICE	MANUFACTURER & CAT. #	REEL DIMENSIONS	DELIVERY (WKS)
A.	**FIBER OPTIC CABLE** (per Tech. Specs)						
A.1	144 Count. Single Mode, ADSS Cable	20,000				84" x 48"	6-8
A.2	96 Count, Single Mode, ADSS Cable	20,000				72" x 44"	6-8
A.3	72 Count, Single Mode, ADSS Cable	20,000				66' x 44"	6-8
A.4	48 Count, Single Mode, ADSS Cable	20,000				60" x 44"	6-8
A.5	24 Count, Single Mode, ADSS Cable	20,000				60" x 44"	6-8
A.6	12 Count, Single Mode, ADSS Cable	20,000				60" x 44"	6-8
A.7	288 Count, Single Mode, ADSS Cable	20,000				84" x 48"	6-8

PRICING NON ADSS LOOSE TUBE TYPE CABLE:

ITEM #	ITEM DESCRIPTION	QTY.	UNIT PRICING ($/FT)	TOTAL PRICE	MANUFACTURER & CAT. #	REEL DIMENSIONS	DELIVERY (WKS)
A.	**FIBER OPTIC CABLE** (per Tech. Specs)						
A.1	144 Count. Single Mode, Fortex DT Cable	20,000				84" x 48"	6-8
A.2	96 Count, Single Mode, Fortex DT Cable	20,000				72" x 44"	6-8
A.3	72 Count, Single Mode, Fortex DT Cable	20,000				66' x 44"	6-8
A.4	48 Count, Single Mode, Fortex DT Cable	20,000				60" x 44"	6-8
A.5	24 Count, Single Mode, Fortex DT Cable	20,000				60" x 44"	6-8
A.6	12 Count, Single Mode, Fortex DT Cable	20,000				60" x 44"	6-8
A.7	288 Count, Single Mode, Fortex DT Cable	20,000				84" x 48"	6-8

1. *ALL Quantities listed above are per reel lengths and shall be considered typical but not guaranteed*
2. *Manufacturer/bidder shall detail policy on shipping charges, including minimum dollar amount to qualify for freight to be included*

South Hadley Electric Light DEPARTMENT

BID FORM - PRICING CONNECTIVITY:

CORNING ITEMS:	**QTY**	**UNIT PRICE**	**DELIVERY WEEKS**	**TOTAL PRICE**
Item #VCAPS20T1UC131UC00 LS Series OptiTect LCP 288 Fiber, Almond, OUT A MOUNT, SC APC (standard),T,FEEDER: 24 Fiber cable 31 m (100ft),No pass-through fibers, DISTRIBUTION: One cable (standard) 288 Fiber RD ALTOS LT Armor Lite 31M (100ft), SPLITTER: None (standard) No module	9	$_____	_____	$_____
Item #WMB4CC6CA6C11132 LS Series 1x32 Coupler/Splitter Module for OptiTect LS Local Convergence Cabinet, SCAPC connectors	71	$_____	_____	$_____
ITem #MOB-0444FD100FW-P OptiSheath® Multiport splice Terminal with bare end stub, 4 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 100.000 Feet, (-P) Individual Packaging	21	$_____	_____	$_____
TERMINAL 4 PORT 50' SCAPC SM OPTISHEATH - M0B0444FD050FWP	58	$_____	_____	$_____
TERMINAL 4 PORT 100' SCAPC SM OPTISHEATH - M0B0444FD100FWP	8	$_____	_____	$_____
TERMINAL 4 PORT 150' SCAPC SM OPTISHEATH - M0B0444FD150FWP	20	$_____	_____	$_____
MULTIPORT 4 PORT SCAPC 200' - M0B0444FD200FWP	41	$_____	_____	$_____
TERMINAL 4 PORT 500' SCAPS SM OPTISHEATH - M0B0444FD500FWP	176	$_____	_____	$_____
Item #MOB-0444FDA00FW-P OptiSheath® Multiport splice Terminal with bare end stub, 4 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 1000.000 Feet, (-P) Individual Packaging	66	$_____	_____	$_____

South Hadley Electric Light DEPARTMENT

BID FORM - PRICING CONNECTIVITY:

CORNING ITEMS:	**QTY**	**UNIT PRICE**	**DELIVERY WEEKS**	**TOTAL PRICE**
Item #MOB-0444FDF00FW-P OptiSheath® Multiport splice Terminal with bare end stub, port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 1500.000 Feet, (-P) Individual Packaging	6	$_____	_____	$_____
TERMINAL 4 PORT 2000' SCAPC SM OPTISHEATH - M0B0444FDL00FWP	2	$_____	_____	$_____
Item #MOB-0844FD050FW-P OptiSheath® Multiport splice Terminal with bare end stub, 8 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 50.000 Feet, (-P) Individual Packaging	10	$_____	_____	$_____
TERMINAL 8 PORT 100' SCAPC SM OPTISHEATH - M0B0844FD100FWP	6	$_____	_____	$_____
Item #MOB-0844FD150FW-P OptiSheath® Multiport splice Terminal with bare end stub, 8 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 150.000 Feet, (-P) Individual Packaging	6	$_____	_____	$_____
TERMINAL 8 PORT SCAPC 200' - M0B0844FD200FWP	4	$_____	_____	$_____
Item #MOB-0844FD500FW-P OptiSheath® Multiport splice Terminal with bare end stub, 8 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 500.000 Feet, (-P) Individual Packaging	45	$_____	_____	$_____
TERMINAL 8 PORT 1000' SCAPC SM OPTISHEATH - M0B0844FDA00FWP	10	$_____	_____	$_____
Item #MOB-0844FDL00FW-P OptiSheath® Multiport splice Terminal with bare end stub, 8 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 2000.000 Feet, (-P) Individual Packaging	2	$_____	_____	$_____
TERMINAL 12 PORT 50' SCAPC SM OPTISHEATH - M0B1244FD050FWP	1	$_____	_____	$_____

BID FORM - PRICING CONNECTIVITY:

CORNING ITEMS:	**QTY**	**UNIT PRICE**	**DELIVERY WEEKS**	**TOTAL**
TERMINAL 12 PORT 50' SCAPC SM OPTISHEATH - M0B1244FD050FWP	1	$_____	_____	$_____
Item #MOB-1244FD100FW-P OptiSheath® Multiport splice Terminal with bare end stub, 12 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 100.000 Feet, (-P) Individual Packaging	1	$_____	_____	$_____
Item #MOB-1244FD150FW-P OptiSheath® Multiport splice Terminal with bare end stub, 12 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 150.000 Feet, (-P) Individual Packaging	1	$_____	_____	$_____
TERMINAL 12 PORT 200' SCAPC SM OPTISHEATH - M0B1244FD200FWP	1	$_____	_____	$_____
Item #MOB-1244FD500FW-P OptiSheath® Multiport splice Terminal with bare end stub, 12 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 500.000 Feet, (-P) Individual Packaging	1	$_____	_____	$_____
TERMINAL 12 PORT 1000' SCAPC SM OPTISHEATH - M0B1244FDA00FWP	1	$_____	_____	$_____
Item #MOB-1244FDF00FW-P OptiSheath® Multiport splice Terminal with bare end stub, 12 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 1500.000 Feet, (-P) Individual Packaging	1	$_____	_____	$_____
Item #MOB-1244FDL00FW-P OptiSheath® Multiport splice Terminal with bare end stub, 12 port OptiTAP® SC APC, Single-Mode (OS2), SST-Drop# FD - Dielectric, 2000.000 Feet, (-P) Individual Packaging	1	$_____	_____	$_____
72-144FIBER EDC W/O PANELS - EDC12PNH	2	$_____	_____	$_____
WATERTIGHT COMPRESSION FITTING	2	$_____	_____	$_____

BID FORM - PRICING CONNECTIVITY:

CORNING ITEMS:	**QTY**	**UNIT PRICE**	**DELIVERY WEEKS**	**TOTAL PRICE**
TERMINAL 12 PORT 50' SCAPC SM OPTISHEATH - M0B1244FD050FWP	1	$_____	_____	$_____
ROC™ OptiTap® Drop Cable Assembly with FastAccess® Technology, 900 µm				
ROC™ OptiTap® Drop Cable Assembly 004301EB49R100F-P	100	$_____	_____	$_____
ROC™ OptiTap® Drop Cable Assembly 004301EB49R250F-P	200	$_____	_____	$_____
ROC™ OptiTap® Drop Cable Assembly 004301EB49R500F-P	200	$_____	_____	$_____
ROC™ OptiTap® Drop Cable Assembly 004301EB49RA00F-P	200	$_____	_____	$_____
ROC™ OptiTap® Drop Cable Assembly 004301EB19R100F-P	50	$_____	_____	$_____
ROC™ OptiTap® Drop Cable Assembly 004301EB19R500F-P	500	$_____	_____	$_____
ROC™ Drop Cable 900um, Fast Access 001EB4-14701DF9	2500	$_____	_____	$_____
ROC™ Drop 900um, Fast Access toneable 001EB1-14701DF9	2500	$_____	_____	$_____
Field Installable OptiTap Connector OSNP-FIOT-ROC-Z	25pk	$_____	_____	$_____
OptiTap Field Installable Toolkit TKT-FIOT-ROC-CF	3	$_____	_____	$_____
Fiber Transition Housing, FTH-76S, 1 OptiTap® #FHT-76S-10200 **(Must Include Fibersonic Logo on FTH)**	500	$_____	_____	$_____

PRICING CONNECTIVITY:

COMMSCOPE ITEMS:	**QTY**	**UNIT PRICE**	**DELIVERY WEEKS**	**TOTAL PRICE**
FOSC -450 A-4-A24-2-T-NV	24	$_____	_____	$_____
FOSC -450 BS-6-A24-3-B-NV	24	$_____	_____	$_____
FOSC -450 B6-6-A24-3-B-NV	24	$_____	_____	$_____
FOSC -450 D6-6-A72-3-6-NV	24	$_____	_____	$_____

BID FORM - PRICING CONNECTIVITY:

CORNING ITEMS:

Description	Part Number	QTY	UNIT	LEAD TIME	TOTAL PRICE
4 rack unit, 144 fiber housing, 12 connectors per panel, SC APC, 16 meter stub, ALTOS loose tube riser, gel free, (OS2)	**ECLE41612D9-U7001B**	12			
4 rack unit, 144 fiber housing, 12 connectors per panel, SC APC, 23 meter stub, ALTOS loose tube riser, gel free, (OS2)	**ECLE42312D9-U7001B**	12			
The Closet Distribution Frame is a 19" 7-ft black aluminum frame with 1.75-in EIA/TIA hole spacing. With a pre-installed jumper trough mounted at the top of the frame, it has a total of 44 rack spaces.	**CDF-ER-7A-19**	9			
CDF IBU Storage Unit for 19" frame	**CDF-IBU-7-6**	12			
Eclipse® Frame, 7 ft with top & bottom shelves, 19in wide, Zone 4 Rated; EIA Rail hole pattern, (17.75" between rails)	**ECL-BAY-7-Z4**	9			
Eclipse® Inter-bay storage unit, dual sided with mandrels	**ECL-IBD-7-1**	12			
Low density OSE, space for 12 OSE splice trays. (10) 1.375in, (4) 1.750in entry ports per plate, stacker for OSE splice trays, with workshelf, standard cable entry, no lock	**OSE-LD0-W0-1**	12			
High density OSE, space for 30 OSE splice trays. (4) 1in, (15) 1.375 in, and (4) 1.9375in entry ports per plate, stacker for OSE splice trays, with workshelf, standard cable entry, no lock	**OSE-HD0-W0-1**	12			
48F Single Fiber Heat Shrink Fusion Splice Tray	**OSE-ST-6**	250			
108f Single fiber heat shrink splice tray	**OSE-ST-9**	100			
OSE Cable Entry Kit .375 to .5 in OD, 1.375in knockout	**OSE-CBL-34**	12			
OSE Cable Entry Kit .5 to .625 in OD, 1.375in knockout	**OSE-CBL-35**	12			
OSE Cable Entry Kit .625 to .75 in OD, 1.375in knockout	**OSE-CBL-36**	12			
OSE Cable Entry Kit .75 to .875 in OD, 1.375in knockout	**OSE-CBL-37**	12			
OSE Cable Entry Kit .875 to 1 in OD, 1.375in knockout	**OSE-CBL-38**	12			
OSE Cable Entry Kit 1 to 1.25 in OD, 1.75in knockout	**OSE-CBL-39**	12			
OSE Cable Entry Kit 1.25 to 1.375 in OD, 1.937in knockout	**OSE-CBL-40**	12			
OSE Cable Entry Kit 1.375 to 1.5 in OD, 1.937in knockout	**OSE-CBL-41**	12			