City of Oak Ridge, Tennessee
* * * * REQUEST FOR QUOTATION * * * *
*** WAREHOUSE STOCK ***

Page - 1
Date - 12/05/14
Order No. - 141929-000 OR
Brn/Plt - 010

Vendor Name:_____
Payment Terms:_____
F.O.B.:_____
Delivery Date:_____
Ship Via:_____
Signature:_____ _____

SHIP TO City of Oak Ridge - Warehouse
100 Woodbury Lane / P.O. Box 1
Oak Ridge, TN 37830
(865)425-1822 FAX (865)482-8475
drose@oakridgetn.gov
Materials Management - D ROSE

L Mayeski 12/5/14

Ordered - 12/04/14 Freight - Default - Handling Code
Requested - 12/12/14 Taken By -
Delivery -

Description / Supplier Item		UM	Unit Cost		Extension	Req. Dt
Fiber Optic #96 Cable	27700.0000	FT	[redacted]	FT		12/12/14
3-5514						

Fiber Optic Cable #96
.
Per attached Specifications
.
Bidder is required to complete bid form including terms, delivery date, signature and company name. Any additions, deletions, or variations from the attached specifications must be noted.
.
Delivery Date provided may be a factor in awarding this bid.
.
Bids due by 2:00 p.m. December 12, 2014
.
Bids may be emailed - drose@oakridgetn.gov
faxed - 865-482-8475
mailed USPS - City of Oak Ridge
Attn: David Rose
PO Box 1
Oak Ridge, TN 37831
UPS/FedEx - City of Oak Ridge
Attn: David Rose
100 Woodbury Lane
Oak Ridge, TN 37830

[redacted] Total Order

[redacted]

City of Oak Ridge Detail Requirements for All Dielectric Self Supporting (ADSS) Aerial Cable

RFQ: 141929

Project Name: Substation 900 to Sub 700 ADSS Fiber Optic Project
The following are project specific requirements for 5.25 miles of ADSS cable. In addition to these requirements, the cable shall conform to the City of Oak Ridge Standard Specification for All Dielectric Self Supporting (ADSS) Aerial Cable, Spec # FPI2000, Rev. 5 dated December 4, 2014 and Telcordia GR-20. The City will purchase 96 fiber cable.

Fiber Type: OFS AllWave®, Corning SMF-28e® ,
Prysmian ESMF or equivalent.

Please provide the Glass Fiber Manufacturer and country where it is manufactured.

Max. Cable Attenuation: 0.35 dB/km at 1310 nm
0.35 dB/km at 1383 nm
0.25 dB/km at 1550 nm

ADSS Loading Condition: NESC MEDIUM

Design D: 27,700 ft of 96 Fiber ADSS:	**460 feet max span**
ADSS Max. Installation Sag:	4.6 feet (vertical) for 460 ft span
ADSS Min. Installation Sag:	3.4 feet (vertical) for 460 ft span
ADSS Max. Worst Case Sag at NESC Medium:	11.5 feet (vertical) for a 460 ft span

MUST USE PLP Limited Tension Deadend # 2872008

The cable will be provided in two cut lengths: 16,500 feet and 11,200 feet.

ALL CABLES must be marked on the jacket, "Oak Ridge Electric"
All reel traverses must be "perfect lay".

Shipping Requirements:
Cable shall be shipped FOB Oak Ridge, TN 37830, freight prepaid and included in the cable/hardware price per foot or unit based on the quantities stated above.

December 4, 2014

Blanton, Gary

From: Denise Frey <denise@fiberplanners.com>
Sent: Tuesday, November 18, 2014 1:28 PM
To: Blanton, Gary
Subject: Fwd: 460' span question
Attachments: 96F ADED1382-12 430ft Medium 0.80%sag.xlsx; ATT00001.htm; image.png; ATT00002.htm

Begin forwarded message:

From: Denise Frey <denise@fiberplanners.com>
Subject: 460' span question
Date: November 13, 2014 7:34:07 PM EST
To: Frank Davidson <Frank.Davidson@prysmiangroup.com>
Cc: Gary Blanton <gblanton@CORTN.org>
Bcc: Gary Blanton <GBlanton@oakridgetn.gov>

The City of Oak Ridge Electric Department (TN) has a question about using a cable design they have purchased from Prsymian. I've attached the spec sheet. It was sold thru WESCO to the OR School Board. It is designed for 430 ft spans.

They would like to order more cable but were wondering if this existing design could be used on a 460 ft span. We could install it at the same installation sag (8%) and could tolerate deeper sag at NESC Medium, perhaps 2.5% worst case sag. We only have a few spans that have gone above 430 ft but we'd hate to have to spec out a different cable.

Would Prysmian please provide the sag tension table for this design used on a 460 ft span?
Denise Frey
(864) 787-8131

12/4/2014

Prysmian Group

PRYSMIAN Draka

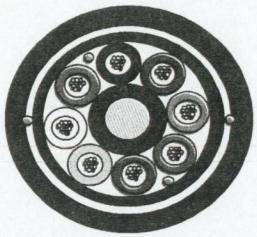
ADSS SAG AND TENSION PROPERTIES

Requirements of:

Fiber Count:	96	Fibers
Maximum Span:	430	ft
Installation Sag:	0.8	%
Installation Temperature:	60	°F

Cable Specifications:

Maximum Rated Cable Load:	1382	lb
Cable Diameter:	0.629	in
Cable Weight:	0.118	lb/ft
Ultimate Tensile Strength:	3204	lb
Sheath Configuration:	Dual Jacket	
Outer Jacket Type:	HDPE	



Loading Conditions: NESC Medium

Ice Thickness:	0.25	in	
Wind Pressure:	4.0	psf	
Temperature:	15	°F	
Safety Factor:	0.2	lb/ft	
Maximum Space Potential:	12.0	kV	Low Pollution per IEEE 1222-2011
Maximum Space Potential	8.0	kV	High Pollution per IEEE 1222-2011

Cable Description: 96F ESM EZSPAN ADSS PKP 1382LB (12F/T)
Part Number: ADED1382-12-ES-096

Installation

Span ft	Installation Sag ft	Installation Sag % Span	Install. Tension lb
43.0	0.3	0.8%	79
86.0	0.7	0.8%	158
129.0	1.0	0.8%	238
172.0	1.4	0.8%	317
215.0	1.7	0.8%	396
258.0	2.1	0.8%	475
301.0	2.4	0.8%	555
344.0	2.8	0.8%	634
387.0	3.1	0.8%	713
430.0	3.4	0.8%	792

Maximum Loading Conditions

Span ft	Loaded Vert. Sag ft	Loaded Horiz. Sag ft	Maximum Tension lb	Cable Angle Degrees	No Wind Vert. Sag ft
43.0	0.4	0.4	300	44	0.5
86.0	1.1	1.1	452	44	1.3
129.0	1.9	1.8	588	44	2.3
172.0	2.8	2.7	714	44	3.4
215.0	3.7	3.6	833	44	4.5
258.0	4.7	4.5	948	44	5.7
301.0	5.8	5.5	1059	44	7.0
344.0	6.8	6.6	1168	44	8.2
387.0	7.9	7.6	1274	44	9.5
430.0	9.0	8.7	1378	44	10.9

Maximum Tension At Maximum Span:

Long Term:	792 lb
Short Term:	1378 lb

Prysmian Confidential

City of Oak Ridge, TN

Standard Specification for All Dielectric Self Supporting (ADSS) Aerial Cable

Specification: FPI2000, Rev. 5

Date Issued: December 4, 2014

City of Oak Ridge
Standard Specification for
All Dielectric Self Supporting (ADSS) Aerial Cable

Specification: FPI2000, Rev. 5
Date Issued: December 4, 2014

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Attachment A: Warranty Statement

I. General Requirements

A. Scope

The scope of these specifications describe, for the vendor, the City of Oak Ridge, TN (hence referred to as 'CORTN') requirements for self-supporting, all dielectric fiber optic cable and suspension hardware to be installed on overhead sub-transmission and distribution lines of 69 kV or less. The cable may also be installed in conduits. The vendor shall, with this proposal, indicate any and all deviations from the requirements of this specification in a Point-by-Point Quote Response. CORTN's project manager will review any discrepancies for a determination as to their equivalency of that intended.

1. Quotation Statement
   A request for a manufacturer to quote this specification or receipt of such, does not constitute nor does it imply that the manufacturer is accepted as a regularly approved vendor or supplier.

2. Detail Requirements
   Project specific requirements, including maximum span lengths, fiber count and performances, are specified in the accompanying the CORTN's Detail Requirements provided with the quote request. Any differing values listed in the Detail Requirements supersede those listed in this document.

3. Materials, Components and Workmanship Statement
   All materials, fabrication, components and workmanship supplied shall be of the highest quality, industrial grade construction and manufacturing techniques. All parts and materials must be new and unused. All parts, materials and cable supplied shall be subject to the requirements of all latest revised applicable standards of IEEE and EIA/TIA.

B. Point-by-Point Quote Response Requirements

1. The information required about the cable shall be, as a minimum, the glass manufacturer and country in which it is manufactured, cable configuration, fiber grade optical characteristics and depressed or matched clad, sag and tension information and all other pertinent information required for an accurate evaluation. Vendor shall also furnish a technical specification for the cable structure offered to include, but not be limited to:

   Nominal cable diameter
   Nominal cable weight
   Minimum bending radius at no load and under tension
   Maximum span length
   Maximum vertical sag at NESC Medium
   Maximum axial load at NESC Medium
   Cable breaking strength
   Maximum Rated Cable Load (MRCL)

2. All exceptions must be listed in the Point-by-Point Quote Response as noncompliant and explain the exception in the quote. A manufacturer's specification alone will not be acceptable.

3. Vendor shall clearly specify the fiber manufacturer to be supplied and the country in which it is manufactured. Vendor shall submit the appropriate data reports on the fiber from the manufacturer in his response to the RFQ. Vendor shall also identify the fiber design as matched clad or depressed clad, zero water peak or low water peak.

4. Sag and Tension Tables

   Vendor shall provide detailed sag and tension charts for the ADSS cables offered, in 50 foot increments for both installation and NESC Medium environmental conditions. Maximum span lengths will be specified in CORTN's Detail Requirements document. Values to be clearly documented are maximum span length, nominal sag at installation, nominal axial loads, maximum vertical sag at stated environmental conditions, and **maximum tension with zero fiber strain.**

5. Installation Information

Vendor shall provide CORTN all the required information for installing the cable on distribution and transmission line structures. The information shall include but not be limited to the following: recommended operating tensions, required equipment and detailed instructions and precautions to be observed during installation. **The successful vendor will provide two days installation training to the distribution crews installing the cable.**

6. Detailed suspension hardware drawings shall be provided, depicting material and dimensions, in particular, the length of the deadend to be supplied.

7. The vendor shall sign and execute the attached warranty statement (at the end of this specification) and return it with the response to this RFQ.

8. **A history of supply shall be provided. This list must include the utility name, contact name, phone number, installation line voltage and years in operation.**

9. Two copies of the Point-by-Point Quote Response and all other technical information shall be sent to the following:

Two copies (technical and pricing) are to be sent to:
City of Oak Ridge Electric Department
100 Woodbury Lane
Oak Ridge, TN 37830
865-425-1803

One copy (technical only) to be sent to:
Denise Frey
Fiber Planners Inc.
4 Long Shoals Rd, Suite B-303
Arden, NC 28704
864-268-6255
denise@fiberplanners.com

C. Specific Cable Requirements

1. Span Length and Sag
   The cable provided shall be designed for aerial installations on distribution and up to 69 kV sub-transmission structures but in potential electrical fields less than 10 kV. Maximum span lengths, maximum installation sag and a maximum worst case vertical sag at NESC Medium Load Conditions are specified in CORTN's Detail Requirements provided with the quote request.

2. The cable provided shall be designed such that the fibers do not experience strain during a sustained NESC Medium Loading condition.

3. The fiber count is specified in CORTN's Detail Requirements provided with the quote request.

4. The cable diameter requirement shall be specified by the vendor, unless specified otherwise in CORTN's Detail Requirements document.

D. Hardware

1. The suspension hardware shall be provided in a wooden or heavycardboard crate. The crate shall be labeled with its associated part number and CORTN's purchase order number.

2. The approved suspension hardware supplier is Preformed Line Products for all cable manufacturers. AFL Telecommunications hardware is acceptable for AFL cable only and must include preformed wire deadends and float mounted tangents.

3. Tangent hardware shall be of the design to allow the piece to float on an anchor shackle. Hard mounted tangents will not be considered.

E. Information Required after Receipt of Purchase Order

1. The successful vendor shall be responsible for all phases of manufactur-

ing, packaging and the safe keeping of the fiber optic cable and hardware while at his facility and in transit to the owner. The cable shall be shipped F.O.B., Destination. Point of shipment shall be stated in the Vendor's Point-by-Point Quote Response.

2. CORTN has the option to request an inspection of the cable while in production and/or an audit of the cable prior to shipment. CORTN shall be given two weeks or more notice before cable enters final testing.

3. All technical correspondence and one copy of all certified test data and reports shall be sent to:

   City of Oak Ridge Electric Department
   100 Woodbury Lane
   Oak Ridge, TN 37830

4. All correspondence and data shall be labeled with CORTN's purchase order number and project name.

II. Optical Requirements

A. Each cable shall have traceability of each fiber back to the original fiber manufacturer's fiber number and parameters of the fiber. Each optical fiber shall be a single mode, glass fiber with a protective outer coating. No fiber splices are to be allowed in a continuous length of cable.

B. The following fiber parameters are the City's minimum requirements. Vendors shall include with their proposals, detailed specifications addressing each of the parameters listed in this section. AllWave™, SMF-28e, Prysmian ESMF Single Mode fiber or equivalent shall be offered. **Vendor shall clearly specify the fiber manufacturer to be supplied and country in which it is manufactured** and submit the appropriate data reports on the fiber from the manufacturer in his response to the RFQ. **If current data is on file with Fiber Planners Inc., no additional test reports are necessary.**

C. Standard Single Mode Optical Parameters:

Fiber Type:	OFS Optics AllWave®, Corning SMF-28e®, Prysmian ESMF or equivalent
Mode-Field Diameter:	9.2 ± 0.4 micron at 1310 nm 10.4 ± 0.5 micron at 1550 nm
Cladding Diameter:	125.0 ± 0.7 micron
Protective Coating:	245 ± 5 micron
Core-Clad Concentricity:	≤ 0.5 micron
Max. Cable Attn. at 1310 nm:	0.35 dB/km
Max. Cable Attn. at 1550 nm:	0.25 dB/km
Fiber Proof Test Parameter:	100 kpsi
Zero Dispersion Wavelength:	between 1300 nm and 1322 nm
Zero Dispersion Slope:	less than or equal to 0.090 ps/(nm^2-km)
Cable cutoff wavelength:	less than or equal to 1260 nm

NOTE: Other attenuation values or fiber parameters may be specified in CORTN's Detail Requirements provided with the quote request.

III. ADSS Cable Construction Parameters

A. General

The cable shall be a telecommunications cable, all-dielectric, self-supporting optical cable designed for the high speed transmission of voice and data communications. The cable shall utilize standard utility line hardware for installation. No cables shall be considered that require special potting compounds for dead-ends or cables with a separate aramid yarn messenger or cables using Fiberglass Reinforced Polyester (FRP) as its only strength member.

B. Fiber Count and Identification

1. Refer to CORTN's Detail Requirements provided with the quote request for particular fiber count requirements.

2. Each fiber in a tube shall be distinguishable from the other by means of Bellcore color coding. The color scheme shall be Blue, Orange, Green, Brown, Slate, White, Red, Black, Yellow, Violet, Pink, and Aqua. Each buffer tube shall be distinguishable from the others by means of the same color coding scheme. Color coding means that each fiber inside a tube and each tube shall be of a totally different color from the others. Fiber counts of 36 fibers and less shall have 6 fibers per tube as their construction. Fiber counts greater than 36 fibers shall use a 12 or 24 fibers per tube construction unless otherwise noted on the Detailed Requirements. Eighteen fibers per buffer tube is not acceptable because of the way the fibers will be divided between the two end users.

C. Buffer Requirements:

The cable provided shall incorporate filled, loose buffer tubes which allow the cable to expand or contract without causing any stress on the fibers.

1. The loose buffer tubes shall be made of high modulus plastic and each shall contain either six (6) fibers per tube, twelve (12) fibers per tube or twenty four (24) fibers per tube.

2. Each tube shall be filled with a soft moisture resistant compound to prevent the ingress of moisture to the fibers. The compound shall act as a lubricant to permit the fibers to '"float" inside the buffer tube. The filling compound shall be nontoxic, non-hygroscopic, non-nutrient to fungus and electrically non-conducting.

3. Each fiber shall be continuous within each tube. No fiber or tube splices are allowed.

D. Cable Core

1. The buffer tubes shall be reverse oscillation lay (ROL) stranded, torsion free, around a dielectric member.

2. The cable core shall be water blocking. The core region shall contain swellable gel material either in a tape or other method so that it is evenly distributed to ensure the cable is water blocked. Dry core technology is preferred.

3. The cable core may be wrapped with either a tape or binder making a complete core unit. If tape or binder are used, it must not deform the buffer tubes or in any way degrade the tubes making them prone to kinking.

E. Inner Jacket

A polyethylene inner jacket shall be extruded over the core tape. This jacket shall provide added protection against the ingress of moisture and enclose the core, buffer tubes and the central strength member. A rip-cord under the jacket shall provide easy jacket removal.

F. Aramid Strength Members

1. The strength of the cable shall be obtained by 100 % coverage from layers of aramid yarn surrounding the inner jacket.

2. The aramid yarn shall be torque balanced and counter-helically applied in layers over the core. There shall be no adhesion of the aramid yarns to the outer jacket. The aramid yarn shall provide the mechanical strength required to support the cable and provide cushioning against crushing.

G. Outer Jacket

1. The entire optical cable core shall be covered with an outer high molecular weight polyethylene jacket that resists deterioration from ultraviolet rays. The covering provided shall be a non-corrosive, non-nutrient to fungus and electrically non conducting jacket. The cable jacket shall be round and smooth and free from holes, cracks, blisters or other imperfections. A ripcord shall be provided to allow for easy removal of the outer jacket.

2. The average thickness of the outer jacket, at any cross section, shall not be less than 85 percent nor greater than 115 percent of the nominal thickness. The minimum thickness of the outer jacket, at any cross section, shall not be less than 70 percent of the nominal thickness.

3. The nominal outer jacket wall thickness shall be specified by the manufacturer; however, the minimum nominal outer jacket wall thickness shall not be less than 1.4 mm.

H. Cable Marking

1. The cable jacket shall be imprinted with the manufacturer's name, year of manufacture and sequential foot markings.

2. Special jacket markings may be required as specified in the Detail Requirements.

IV. Design Acceptance Tests

A. General Design Tests shall be performed in general accordance with the IEEE Standard 1222 for All-Dielectric-Self-Supporting Cable. All measurement procedures shall be per relevant EIA/TIA Standards.

B. Parameters
The following mechanical parameters are CORTN's minimum requirements. Vendor shall submit to the project manager all test reports documenting that each of the following tests have been performed at the manufacturing facility on a cable sample similar to the cable to be delivered under this specification or verify the tests are on file at Fiber Planners Inc. (864-268-6255). Tests must be preformed within the past five (5) years. Preference will be given to recent data (i.e., from annual product re-qualifications).

1. Crush Resistance
The cable provided shall withstand the compressive load of 125 lbf per inch at 20°C with no detectable damage to the fibers. This test shall be conducted in accordance with EIA/TIA-455-41 and no attenuation increases are allowed. No fiber or cable damage shall be evident.

2. Impact Resistance
The cable provided shall withstand the impact test described in TIA-455-25. No cable damage or fiber break shall occur due to the impacts.

3. Minimum Bend Radius of Cable

a. Minimum Bend Radius at No Load shall be ten times the cable diameter or less. Minimum Bend Radius at Maximum Tension shall be twenty times the cable diameter or less.

b. The cable provided shall withstand the bend test described in EIA/TIA-455-33 and EIA/TIA-455-37.

4. Temperature Requirements:

a. Storage temperature:	-50°C to +70°C
Installation temperature:	-30°C to +60°C
Operating temperature:	-40°C to +60°C

b. The cable provided shall withstand a temperature cycling test in accordance with EIA/TIA-455-3. The optical performance of the cable shall not be degraded when subjected to the above temperature extremes.

5. Tensile Strength
A test report should be supplied to verify that the cable and deadend assemblies are designed for the full tension of the cable design.

6. Stress Strain Tests
The cable shall have a verifiable modulus of elasticity and breaking strength of the cable. Provide a test report, if available, to verify these values.

7. Water Penetration
The cable shall not allow water to migrate inside the cable core or tubes. Provide a test report to verify this parameter.

8. Dry Core Requirement testing
Documentation shall be provided confirming the cable's survivability to -2°C for 24 hours per the External Freezing test in EIA/TIA-455-98.

V. Routine Production Tests

A. General

Vendor shall submit to the project manager test reports documenting that each of the following tests have been performed at the manufacturing facility on the supplied cable(s) prior to shipment.

B. Optical

Prior to shipping, the supplier shall test each fiber to verify that both the City and the glass fiber manufacturer's specifications are met. Each of the fibers in each of the cable reels shall be completely tested with an Optical Time Domain Reflectometer (OTDR) in accordance with EIA-455-59 and EIA-455-61 at 1550 nm on a bidirectional averaged basis and final test data attached to each reel. A copy of the table of test data shall be sent to the project manager listed in Section I.E.3.

VI. Packaging and Shipping

A. All cable shall be shipped with one length per reel. The cable shall be supplied on nonreturnable, all weather, lagged wooden reel(s) substantial enough to prevent damage to the product during shipment, handling, installation and long term storage. The reel(s) shall be designed for outdoor storage in accordance with appropriate NEMA Standards. A solar wrap is preferred under the lagging and each reel shall be fully lagged with 2x4 boards. Other protective systems will be considered but must be fully described and provide reasonable protection from damage during shipping.

B. Each cable length shall be spooled onto the shipping reel in a neat and perfect wind. The switchback at the flange must be smooth and level.

C. Each hardware container shall be identified with an information tag made of a durable and weather resistant material and contain the following minimum information: Manufacturer's Name or Trademark, CORTN's Purchase Order Number, Part numbers and Quantity.

D. The cable cut lengths shall be provided on CORTN's purchase order. The ship length tolerance for each cable shall be - 0%, + 1%. **The billable length tolerance is +100 ft.**

E. Both ends of the cable shall be sealed in order to prevent the ingress of moisture.

F. Both ends of the cable on the reel shall be accessible for connection to field optical test equipment. The inside tail shall be accessible for ease of testing during restoration and shall be a minimum of 12 feet.

G. No partial or unfinished (e.g. non-sequential) cable reel shipments shall be accepted or received without written permission from the project manager listed in Section I.E.3. All reels, unless specific written release is given by the project manager, shall be shipped in sequential order by reel numbers as supplied at the time of purchase.

H. Reel number shall be painted with large bright "day glow", international orange' in a clear manner on the outside flanges. The minimum height of the painted reel number shall be 4 inches.

I. The center arbor hole shall be 3.0" x1/16" diameter and metal reinforced. Two brake holes of 1.5" shall be provided at a 7" radius from the arbor and 180° apart. **The requested maximum reel size shall to be 72 inch diameter by 60 inch width. Larger reels may be provided with CORTN's project manager's permission.**

J. The manufacturer shall, at the time of shipment, inform the "SHIP TO" person listed on the Purchase Order of the following information:
   Purchase Order Number
   Number of items being shipped per purchase order
   Weight and dimension of each item (Heaviest/Largest)
   Estimated time of arrival

K. Truck shipment shall be arranged with the individual listed under "SHIP TO" on the Purchase Order at least two weeks prior to shipment. In addition, the

manufacturer shall require the carrier to give 24 hours advance notice to the individual listed under SHIP TO" at the phone number indicated on the Purchase Order with an estimated delivery arrival time. Notice must be given between the hours of 8 AM and 3 PM between Monday and Friday.

L. The cable and hardware shall be shipped on **flatbed trucks** in order to allow a fork-lift to remove the reels and pallets. A lift gate truck may also be used with prior approval from CORTN.

M. The project may have cable release dates in order to stagger the cable shipments and payments. Please refer to the Detail Requirements for more information pertaining to the specific project.

Warranty Statement

The cable submitted in this quotation to the City of Oak Ridge, TN (CORTN), shall have a minimum warranty of three years from installation against failure due to the manufacturer's workmanship. The cable manufacturer shall be given the opportunity at its own expense to qualify and train the installation crews on proper methods.

If in such case a failure occurs and is defined by the owner and manufacturer as a failure of manufacturer's workmanship, all material and labor costs to remove, repair, and/or replace the cable shall be paid by the cable manufacturer. These costs will not exceed the average of at least three estimates from utility qualified construction crews agreed to by both parties.

The life expectancy of the installed fiber optic cable described in this quotation shall be 40 years.

The cable manufacturer agrees to hold the City of Oak Ridge, TN and Fiber Planners Inc. harmless concerning any patent infringements relating to the All Dielectric Self Supporting cable or hardware and/or materials contained.

The warranty period for cable supplied shall be _____ years.

Company Name and Address: _____

_____

Signature of an Authorized
Executive Corporate Representative: _____

Printed Name and Position: _____

Date: _____

Signature of Notarizing Witness: _____

Printed Name: _____

Date: _____