

# **Technical Requirements**

## **Dark Fiber Lease AND Pole Attachments**

**Design, Implementation, Operation, Maintenance and Response**

# **Dark Fiber Design, Implementation, Operation, Maintenance and Response**

## **Dark Fiber Access Point**

### **A. IMPLEMENTATION OVERVIEW**

- 1) Information to be learned and exchanged during both the preliminary and feasibility study activities will guide development of Customer's ultimate design package.
- 2) Authority will establish a Point of Connection (PoC) that will serve as the ownership demarcation of facilities required to utilize Authority-owned Dark Fiber.
- 3) Lessee will construct Lessee's Facilities required to bring Lessee's fiber to the PoC established by the Authority for this purpose. Authority will complete optical connections at the PoC to establish Lessee's Dark Fiber access.

### **B. REVIEW & APPROVAL**

- 1) Lessee will outline location(s) suited to Dark Fiber connection requirements as part of a design package for each PoC. Preference for establishing a new Dark Fiber PoC will be given to those locations adjacent to existing Authority fiber optic splice enclosures.
- 2) Prior to establishing access to Dark Fiber, Lessee must present to Authority a finalized design package of each proposed PoC for review and acceptance in advance of construction activity commencement. Such package must include the specifications referenced in Section C of these Dark Fiber Technical Requirements. The design package must be reviewed and stamped by a qualified Professional Engineer and must include a complete construction schedule.
- 3) Following review of the design package, Authority will notify the Lessee of acceptance for the proposed Dark Fiber PoC installation(s). Any design package modifications required by the Authority will be communicated to Lessee and must be resolved prior to issuance of the acceptance letter.
- 4) Upon agreement and approval, Authority will establish facilities required to construct a new Dark Fiber PoC through use of a splice enclosure installed and configured for use as the PoC interface.
- 5) Lessee will be responsible for construction of Lessee's facilities to the PoC. Lessee must be responsible for all costs associated with establishing a new PoC, or the incremental costs associated with adapting an existing PoC for additional use.

- 6) Authority will establish access to Dark Fiber by completing required optical splices within the PoC enclosure.

### **C. DESIGN PACKAGE REQUIREMENTS**

- 1) Design package must include a survey of the site requested for establishing each PoC.
- 2) Design package must include the Authority structure identification (TEFIS Structure ID) for each proposed PoC. Should another PoC be already in place at the location requested by the Lessee, Authority will strive to adapt arrangements to accommodate each Lessee's access to Authority Dark Fiber.
- 3) Design of Lessee's installation must include no guys within the Authority right-of-way. Lessee-installed enclosures must not protrude above grade and must meet or exceed ANSI Tier 22 load rating for use within Authority right-of-way.
- 4) Design package must include Bill of Material "BOM" (list of material components used to construct) required to establish the PoC for the Lessee's connectivity.
- 5) Lessee is responsible for extending infrastructure necessary for connection to the Authority-provided PoC and should incorporate use of:
  - i. Underground conduit/cable that is clearly marked with above-grade cable marker posts, and/or
  - ii. Aerial pole line extensions that maintain adequate clearance from existing transmission facilities.
- 6) Design package will outline details for delivering Lessee's fiber optic cable extension to the Authority-constructed, owned, and operated PoC. The design package should include:
  - i. Placement and size of Lessee-installed conduit on the site that is used to deliver Lessee's fiber optic extension to the PoC interface.
  - ii. Location of all enclosures, cable/conduit routing or aerial pole placement required for Lessee's Facilities.
  - iii. Lessee will be responsible for bringing single-mode optical cable strands to the PoC interface established by the Authority.

### **CONSTRUCTION PROCESS**

- 1) Upon written acceptance by Authority for the installation of a PoC facility, Lessee may begin the construction activities in accordance with the final construction schedule included as part of the accepted design package.
- 2) Lessee or Lessee's contractor must have an on-site field representative at all times

during the construction process. Lessee must ensure that the construction process adheres to the final, approved designed package.

- 3) Authority will inspect and approve the completed installation prior to the PoC being placed in-service. Any required corrections or deficiencies will be documented for the Lessee and must be resolved prior to placing the PoC into operation.
- 4) Lessee shall provide to Authority final design as-builts (MicroStation CAD files and PDFs) and copy of all design documents.
- 5) Authority will complete access and connectivity to Authority Dark Fiber through the PoC using Lessee Facilities prepared and provided by the Lessee.

#### **D. OPERATION & MAINTENANCE**

- 1) Authority will be responsible for the operation and maintenance of the PoC and will retain all access to the enclosure designated as the PoC.
- 2) Operation and maintenance costs of the PoC will include, but are not limited to, future structure replacements, line relocations, and all access to designated PoC facilities on behalf of the Lessee.
- 3) Under all circumstances, operation of power system facilities and services will take precedence over communications services, including that of Dark Fiber Lessees.

#### **E. OUTAGE COORDINATION**

- 1) Advanced scheduling of any Authority planned outages for fiber optic facilities designated as Dark Fiber will be administered through the Authority's Network Operations Center (NOC).
- 2) Lessee notification of unplanned or emergency outages impacting Dark Fiber facilities and the projected restoration times will be managed by Authority NOC personnel.

**F. RESPONSIBILITIES AT END OF USE AGREEMENT**

- 1) Upon the date of service termination, Authority will disconnect Lessee's access to Authority Dark Fiber within the PoC interface.
- 2) Lessee will remain responsible for removing those assets owned by Lessee and located on property owned or authorized for use by the Authority through existing easements.
- 3) Associated Lessee charges and expenses defined under terms of the Dark Fiber service agreement will continue to accrue until removal of Lessee's assets is complete.

# EXHIBIT A Fiber Specifications, Demarcation, Maintenance, Acceptance & Acceptance Testing, Response Time

## Section 1 – Fiber Specifications

**1.0 Fiber Types.** Generally, Authority will use single mode fiber. The Fiber is packaged in an Optical Ground Wire (OPGW) or All-Dielectric Self-Supporting Fiber (ADSS).

**1.1 Fiber Performance Specifications.** Authority may substitute alternative fibers if and only if such alternative fibers have performance specifications which are at least equal to the specifications set forth below:

- (a) Optical Cable with Single Mode Fiber
  - i. Attenuation at 1310 nm = 0.5 dB/mi max
  - ii. Attenuation at 1550 nm = 0.4 dB/mi max

### **1.2 Other Fiber-related Standards**

- (a) All fiber(s) will be fusion spliced.
- (b) Any optical interface, such as pigtail connectors and adapters will be SC.
- (c) All fibers will consist of all single mode fiber. Any riser rated cable must be a cable that is flame-retardant UV-stabilized, fully water-blocked for use in any application, and suitable for installation in duct, aerial, and risers. All fiber(s) will meet the UL-1666 OFNR specifications and will consist of loose buffer tube construction.
- (d) Fiber(s) will be constructed in accordance with sound commercial practices and these Technical Requirements. The National Electric Safety Code will be followed in every case except where local regulations are more stringent, in which case local regulations will govern.
- (e) Fiber labeling scheme in a manhole environment where the parties meet will be determined in the design package.

## Section 2 – Demarcation Points

**2.0 General.** Demarcation Points define the respective ownership and maintenance responsibilities and obligations of the parties. Demarcation Points will be specified in each executed design package. Generally, Demarcation Points will be located in the Authority's easements or Rights of Way.

Authority will provide Facilities such as manhole, splice case, or fiber optic distribution unit (FODU) that will terminate the fiber and be the Demarcation Point between Authority's ownership and maintenance responsibilities and Lessee's ownership and maintenance responsibilities. Authority shall be responsible for maintenance of all Authority fibers on the Authority side of the Demarcation Point, as well as any Authority Facilities within Demarcation Points. Lessee shall be responsible for maintenance of all fibers on the Lessee's side of the Demarcation Point, as well as any Lessee Facilities within Demarcation Points.

The parties will work cooperatively under an approved Method of Procedure (MOP) (see Section 3.9 and Attachment A-2) or construction plan to cross-connect and test the Fibers at and through the Demarcation Points for the purposes of Acceptance testing.

Lessee may physically monitor any or all testing associated with preparation of an Acceptance Package (the documentation of results or information provided for review and acceptance) upon three (3) business days' notice prior to commencement by Authority.

**2.1 Access.** Lessee may be granted Authority-Escorted Access to Demarcation Points to service Lessee infrastructure through the Scheduled Maintenance Notification process outlined in section 3.10.

### **Section 3 – Maintenance and Repair General**

**3.0 Responsibilities.** Authority shall be responsible for maintenance of all Authority Fibers on the Authority side of the Demarcation Point, as well as any Authority Facilities within Demarcation Points. Lessee shall be responsible for maintenance of all Fibers on the Lessee's side of the Demarcation Point, as well as any Lessee Facilities within Demarcation Points.

IN NO EVENT WILL LESSEE PERSONNEL, TECHNICIANS OR CONTRACTORS HANDLE OR OTHERWISE COME INTO CONTACT WITH AUTHORITY-OWNED FIBER CABLE OR ANY CONDUCTORS UNLESS AUTHORIZED BY AUTHORITY.

**3.1 Contacts and Escalation Information.** The parties will, at the beginning of each year, provide one another with an updated contact and escalation list to aid in trouble reporting and resolution, if changes have occurred since the previous year. The current list is attached as Exhibit A-1 and may be revised by either party from time to time by written notice as provided for in the Fiber Lease Agreement. Inaccurate contact and escalation information may prevent or delay Authority from performing notification or other obligations.

**3.2 Fiber Restoration Standards and Priority.** In the event of a Leased Fiber cut caused by either Scheduled Maintenance or a Service Affecting Condition (any condition or event that causes an interruption in connectivity or service) event, any splicing of the Leased fibers by Authority, or Authority's approved contractors will be done in a systematic manner with Leased Fibers having equal priority with other third party fibers within the cable. Because Authority's Network is principally used for the management of Authority's electrical system, all fiber used for control of electrical system communications will be restored as the highest priority.

The Lessee may, at its sole cost, have representatives present to monitor the progress of Authority's restoration efforts.

**3.3 Re-Testing.** Lessee, at its sole cost and expense, may re-test the Leased Fibers at any time during the term of this Agreement from and to its own equipment.

If it is reasonably determined that the Leased Fibers do not comply with the design package, Authority will correct the deficiencies at its expense, unless the deficiencies are caused by the act or omission of Lessee or by Lessee's Facilities, in which event Lessee will reimburse Authority for all costs, plus a 30% mark-up to correct the deficiencies. After correcting the deficiencies, Authority shall re-test the Fibers according to Section 4 Acceptance and Acceptance Testing of this Exhibit.

If Authority is unable to correct the deficiencies within thirty (30) days of the re-test, Lessee may request that Authority provide substitute fibers and Authority shall provide such substitute fibers if available.

**3.4 Use of Subcontractors.** Authority may outsource to third-party service providers or suppliers any Services it is obligated to provide under this Agreement. Upon request, Authority will send to Lessee a current list of Authority's third-party service providers.

**3.5 Coordination of Maintenance with LEC (Local Exchange Carrier).** Lessee shall be responsible for coordinating Scheduled Maintenance and Service Affecting Condition response and repair involving the LEC, including preparation, review and approval of MOPs between and among Lessee, Authority and the LEC.

**3.6 General.** Scheduled Maintenance may occur for the purpose of maintaining or enhancing Authority's electrical system or for Lessee business needs. Maintenance of Authority OPGW fiber located in the static position on high voltage transmission lines, typically requires an outage on a portion of Authority's electric system. Authority will make commercially reasonable efforts to perform Scheduled Maintenance in a manner as to avoid a Service Affecting Condition. Notwithstanding anything herein to the contrary, Authority has the right to perform Scheduled Maintenance without prior approval of the Lessee, if the Scheduled Maintenance does not cause a Service Affecting Condition.



**3.7 Single-Point-of-Failure.** In the instance of a single-point-of-failure on an Authority fiber segment, Scheduled Maintenance may cause a Service Affecting Condition. Such events are not subject to the terms of Exhibit B (Service Interruption Credits), unless specifically provided for otherwise in an executed design package.

**3.8 Access.** Lessee will grant timely access to Authority at any Lessee Facilities that affect fiber. A delay in the provision of access by Lessee shall relieve Authority from its obligations under Exhibit B (Service Interruption Credits), for the period of time access was delayed by the action or inaction of Lessee.

**3.9 Method of Procedure (“MOP”).** The MOP is used for coordinating Scheduled Maintenance operations between Authority and Lessee using the form included as Attachment A-2. Both parties can revise the MOP form upon mutual agreement. All Scheduled Maintenance will be performed in accordance with the MOP and conducted according to the MOP process. The party receiving the completed MOP form will review the MOP to correct deficiencies detected before or during the actual performance of Scheduled Maintenance and request appropriate changes. Any MOP will be accepted via electronic mail.

**3.10 Scheduled Maintenance Notification.** The parties will make reasonable efforts to notify one another not less than five (5) business days’ prior notice to the scheduled time, of any anticipated Scheduled Maintenance. For all Scheduled Maintenance, the notification will include:

- (a) An assigned technician, by name and contact number.
- (b) A description of the work to be performed.
- (c) Identification of what Fiber Systems or Fiber will be affected.
- (d) A date and time when the Scheduled Maintenance will take place, and an estimated completion time. For multiple-day requests, each day’s activity and impact will be detailed.
- (e) A list of all locations to be impacted by the Scheduled Maintenance for each site.

**3.11 Review of Notification.** When one party receives a request for Scheduled Maintenance, it will verify the date, time, location and activity to ensure no conflicts exist with either on-going or previously scheduled work and will respond to the other party within two (2) business days of receipt of such request.

If a conflict exists regarding Scheduled Maintenance, Lessee and Authority will coordinate to establish a new date if possible. Authority has sole discretion in scheduling Authority Scheduled Maintenance involving its electric system.

**3.12 Authority Scheduled Maintenance Windows.** To the extent possible without conflicting with Authority electric system operations and standards, Authority will

attempt to conduct its Scheduled Maintenance at a time that will least affect Lessee's use of the Leased Fiber. Generally, Authority will perform Scheduled Maintenance during daylight hours, particularly when Scheduled Maintenance involves OPGW Fiber. Standard Authority Scheduled Maintenance windows are during normal Authority business hours of 6:00a.m. – 5:00 p.m., Monday through Friday.

Lessee may request "off-hour" maintenance windows, which must be the result of a mutually approved MOP and coordinated through their respective Network Operations Centers (NOCs).

These "off-hours" maintenance windows are normally between the hours of 11:00 p.m. – 6:00 a.m., or as mutually agreed to between the parties.

**3.13 Event Management.** The Lessee will be permitted to witness all Service Affecting Condition scheduled events. In addition to a completed MOP form, Authority must notify Lessee immediately prior to commencement of work. Authority will provide sufficient information to allow Lessee to, at their own cost:

- (a) Coordinate directly with one another and communicate any additional preventative steps or measures not foreseen during initial planning.
- (b) Ensure that work efforts or unforeseen problems do not affect other work activities that are in progress.

**3.14 Status Notifications.**

- (a) **Progress Reports.** Authority will notify Lessee on progress or anticipated delays due to unusual circumstances, or when the maintenance windows deviate from original estimates in the MOP. Communication of status will occur every four (4) hours during normal business hours or immediately if unanticipated delays, events, or significant deviation from the approved MOP occur, and may be accomplished by telephone, including a voice mail message if during off-hours, or e-mail.
- (b) **Closing Notification.** When the Scheduled Maintenance is considered complete, and all components are operationally ready, Authority will notify Lessee to verify that any related service affecting conditions have been cleared. Notification may be by telephone, voice-mail or e-mail. The notification will include the date and time the work was completed, and the alarms were cleared. The Lessee may request an extension to the MOP if equipment or other problems preclude proper operation. In this event, the Lessee must make commercially reasonable efforts to resolve the problem and allow Authority to complete the MOP.

**3.15 Scheduled Maintenance During Force Majeure Events.** Scheduled Maintenance that occurs or coincides with unexpected events such as a storm, disaster, accident, or as otherwise described in Article 7.5 and 9 of the Master Fiber License Agreement, may prevent Authority from meeting Scheduled Maintenance intervals. In

such events, Scheduled Maintenance will be re-scheduled to another available time, according to a MOP.

**3.16 Response and Repair Intervals.** Upon receipt of notification of discovery during Scheduled Maintenance windows as described in section 3.12 of this Exhibit, Authority will dispatch properly equipped and trained personnel to a Service Affecting Condition to assess the affected Fiber within four (4) hours and repair within twenty four (24) hours post assessment (“Completion Interval”) or Service Interruption Credits will apply. Upon receipt of notification of Discovery outside of Standard Authority Scheduled Maintenance windows, Authority will dispatch properly equipped and trained personnel to a Service Affecting Condition to assess the affected Fiber within six (6) hours repair within twenty four (24) hours post assessment (“Completion Interval”) or Service Interruption Credits will apply. Any exceptions to these standard Service Affecting Condition response and repair intervals or any priority treatment of Fiber must be mutually agreed to and incorporated in an executed Product Order.

**3.17 Trouble Notification by Lessee.** Network outages that are Discovered by Lessee will be reported immediately to the Authority NOC or as otherwise indicated in Exhibit A-1 or the executed Product Order. After response to the Service Affecting Condition, Authority will promptly notify Lessee regarding the nature of the trouble.

**3.18 Trouble Notification by Authority.** Authority’s network management system does not monitor dark fiber. However, a degradation of performance on Authority internal network services that might indicate a fiber cut will result in a trouble notification to the Authority NOC. If Authority discovers a network problem causing a Service Affecting Condition, Authority will promptly attempt to notify Lessee according to Exhibit A-1 regarding the nature of the trouble and whether the Fiber caused the trouble.

**3.19 Temporary Restoration.** Temporary restoration will be scheduled and performed as soon as practical. This restoration schedule will be mutually developed and approved prior to proceeding. Temporary repairs, if applicable, to the Fiber will provide temporary restoration of service until a permanent repair is performed and will be performed by Authority. After temporary repairs have been completed, Lessee may test the Fibers from an access point designated by Authority, to ensure integrity of the repairs and provide Authority with a copy of the test results.

**3.20 Permanent Restoration.** Permanent restoration will be scheduled and performed as soon as practical. This restoration schedule will be mutually developed and approved prior to proceeding. Permanent repairs to the Fiber will return it to the specifications and will be performed by Authority. After final repairs have been completed, Lessee may test the Fibers from an access point designated by Authority, to ensure integrity of the splices and provide Authority with a copy of the test results.

**3.21 Trouble Ticketing Process and Procedures.** A mutually acceptable trouble ticketing process conducted between Lessee and the Authority NOC will be developed between the parties as needed. Generally, upon discovery, the Authority NOC will acknowledge the discovery, record the time and other information, and open a trouble ticket.

**3.21 Status Notification.**

- (a) **Progress Reports.** In addition to the initial notification, Authority will use commercially reasonable efforts to provide a progress report, during normal business hours, by telephone, including a voice mail message if during off hours, or e-mail, every four (4) hours during a Service Affecting Condition. Authority will immediately notify the Lessee if unanticipated delays or events occur.
- (b) **Closing Notification.** When Service Affecting Condition repair is considered complete and all components are operationally ready, Authority will notify the Lessee to verify that all related service affecting conditions have been cleared. Notification may be by telephone, voice-mail or e-mail. Once notification is made, the open trouble ticket will be closed. When service affecting conditions have been verified and the activity is considered complete, Authority will coordinate final event closure with the Lessee. If contingency plans were implemented to protect the network during the performance of scheduled activities, Authority will direct activities necessary to return the network to its normal configuration. Authority will submit a fiber outage report to the Lessee.

**3.22 Lessee-Caused Service Outage.** If an Authority technician is dispatched to respond to a service outage after a Lessee discovery and notification, and the trouble is on the Lessee side of the Demarcation Point, Lessee will be billed for Authority's costs, plus a 30% mark-up.

**Section 4 – Acceptance & Acceptance Testing**

**4.0 General.** Authority will perform fiber testing as described below and in accordance with the Fiber Specifications as described in Section 1 (Fiber Specifications) of this Exhibit. Authority will test all Fibers at installation to assure operating characteristics are consistent with the Specifications. Authority will perform Fiber re-test upon Lessee request following Scheduled Maintenance or Emergency Maintenance events.

**4.1 Testing Methods.** Authority will perform end-to-end connectivity testing of the Fibers, and any necessary bi-directional span testing. Loss measurements will be recorded using an industry accepted laser source and a power meter.

- (a) **OTDR Testing.** Optical Time-Domain Reflectometry (OTDR) traces will be taken, and splice loss measurements recorded and summarized on data sheets. For any span, OTDR testing will be performed where the fiber is terminated with a connector.

OTDR testing will be conducted at both 1310nm and 1550nm wavelengths. OTDR testing will be conducted on a bidirectional basis for each Fiber(s) in each Segment at the appropriate wavelengths described above. The Acceptance Package will contain the actual traces that detail the testing parameters.

- (b) **Insertion Loss Testing.** This end-to-end loss measurement will be conducted from both directions for each Fiber(s) in a Segment. The bi-directional average will be used to determine the end-to-end loss of the Fiber(s) in a given Segment at each appropriate wavelength. This test will be conducted at both 1310nm and 1550nm. This insertion loss testing will ensure fiber continuity and the absence of crossed fibers in the Segment. All terminated Fiber(s) will be tested from the FODU, or other end points as specified in an executed Product Order, for each Segment. Insertion loss test results for Fiber(s) in a Segment must conform to the limitations identified in Limitations and Specifications section of this Exhibit, Bi-directional OTDR Testing.

**4.2 Loss Measurements.** This measured end-to-end loss value will be calculated based on; fiber strand attenuation as specified by the fiber optic cable manufacturer, the average splice loss, and industry standard connector loss. These three components will be considered the acceptance criteria and measured as dB loss from customer site to customer site. If after three (3) testing attempts, the Authority technician is not able to produce a loss value within ranges stated below, the route will be brought into tolerance. OTDR events close in proximity to a test launch (connectors or splices in a building) will not be identified as events within the testing documentation. Rather, such events will be accounted for in the end-to-end loss budgets and documented.

(a) The loss characteristics for Single Mode Fiber (SMF28) are described below:

- i. at 1310nm: 0.5 dB loss per mile; 0.15 dB loss per fusion splice  
“average”
- ii. at 1550nm: 0.4 dB loss per mile; 0.15 dB loss per fusion splice  
“average”

(b) Connector(s) and/or Jumper(s) Test Results

- i. Connectors that terminate Fiber(s) in a Facility must be SC.
- ii. All Fiber protection for fan-out and terminating fiber jumpers at Facilities will have 900- $\mu$ m tight buffer tube, a Kevlar strength member, and a cable jacket with an overall diameter 2.9mm.
- iii. Reflectance must meet or exceed -45 dB for each connector event.

**4.3 Fiber Splicing.** All splices are fusion splice technology and will be measured from Lessee location to Lessee location. Acceptable splice loss specifications will be

calculated as an average and shall not exceed a 0.15 loss per splice average. This will be measured with an industry accepted OTDR, at 1310 and 1550 nm. Test measurements will be performed bidirectional.

Example: A strand of fiber is spliced at 12 separate locations within the fiber strand, from customer location "A" to customer location "B." The calculation to be used for acceptance is as follows:

$$12 \times 0.15 \text{ dB} = 1.8 \text{ dB}$$

1.8 dB = the maximum allowable db loss, specific to splice loss acceptance, for the fiber strand segment from customer location "A" to customer location "B."

**4.4 Test Results and Acceptance Documentation.** Test data will be placed in electronic format to document the test results. All test results will be attached as documentation in support of the specific Acceptance Test Package for the Leased Fibers under test for each Product Order. If splicing was involved before testing, a confirmation sheet or splice location sheet shall also be filled out and kept in the Authority records.

**4.6 Fiber Acceptance and Acceptance Package.** The Fiber is considered Accepted under the following conditions;

- (a) Receipt by Authority of a copy of the Acceptance Package signed by Lessee, or
- (b) Upon ten (10) days after Authority's submission of the Acceptance Package and Lessee has failed to notify Authority the Excess Fiber is not in accordance with the Technical Requirements, or
- (c) In the event of an Expedited Product Order, the scheduled due date for the Lessee's notifying Authority of its Acceptance if no such notice has been provided.

**4.7 Deficiency Notification and Conditional Acceptance.** Lessee must provide Authority a deficiency notice within ten (10) business days of receipt of the Acceptance Package. Upon receipt of Deficiency Notice, Authority must correct the deficiencies bringing the Fiber(s) into compliance within the Specifications set forth in this document, or as specified in a Product Order, within seven (7) business days, or Lessee may exercise its rights under the Agreement.

## Attachment A-1 Contact/Escalation List Form

### Authority NOC Contact/Escalation List

Authority's Network Operations Center ("NOC") is available twenty-four (24) hours/day, seven (7) days/week.

<b>Local Area:</b>
<b>Toll Free: No toll free number at this time</b>

### Authority Escalation

In the event of communications service emergency, please refer to the described process within this document and call 843-761-8000 x 5687. For problem resolution regarding operational matters, the following contact table should be used:

Level	Contact Name	Title	Telephone Numbers	Email Address
1	NOC		(o)843-761-8000 x 5687	
2	Jill Sullivan	Tech Supervisor, Communications	(o) 843-761-8000 x 4730 (c) 843-296-3204	Jill.Sullivan@santeecooper.com
3	Brian Stevick	Manager, System Communications	(o)843-761-8000 x 5356 (c) 540-538-5873	<a href="mailto:Brian.Stevick@santeecooper.com">Brian.Stevick@santeecooper.com</a>
4				

### Lessee Field Operations

(Group/Department)	Name/Title	(Phone number) (Fax Number) (Address)
(Group/Department)	Name/Title	(Phone number) (Fax Number) (Address)

### Escalation

In the event of emergencies or problem resolution regarding maintenance matters, use the following contact table:

Level	Contact Name	Title	Tel. #	Cell Phone	Email Address
1					
2					
3					

**Attachment A-2: Scheduled Maintenance Procedure Form**

**Authority Method-Of-Procedure  
Fiber Optic Scheduled Maintenance Outage Notification**

**Authority MOP Number:**

**From Node:**

**To Node:**

**Date Originated:**

**Originator:**

**Phone Mobile:**

**Responsible Technician:**

**Mobile:**

**Pager: Job Location:**

**Brief Job Description:**

**Access required?**

**Where?**

**\*\*\*\*\*ACTIVITY CLASSIFICATION\*\*\*\*\***

**Scheduled Maintenance**  **Emergency Maintenance**

**Date of Outage:**            **Time of Day Requested:**

**Expected Duration of Scheduled Maintenance:**

**Completion Date/Time:**

**Maintenance Window:**



**\*\*\*\*\*APPROVALS\*\*\*\*\***

**Operations Supervisor:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**\*\*\*\*\*GENERAL SPLICE DESCRIPTION\*\*\*\*\***

**Number of Fiber Splices:**

**\*\*\*\*\*PRE SPLICE ACTIVITY\*\*\*\*\***

**Description:**

**\*\*\*\*\*POST SPLICE ACTIVITY\*\*\*\*\***

**\*\*\*\*\*THIS CONCLUDES THIS MOP\*\*\*\*\***

**Originator:** \_\_\_\_\_ **Department:** \_\_\_\_\_

## EXHIBIT B Service Interruption Credits

**1.0 General.** For a Service Affecting Condition, the Lessee will be entitled to Service Interruption Credits for the affected design package, according to the following terms. Lessee must request a credit in writing within thirty (30) days after the delivery of an invoice respecting the affected Fiber, or within thirty (30) days after the Discovery of the Service Affecting Condition, whichever is later, or any claim is waived. Request must provide necessary information describing the Service Affecting Condition event including:

- (a) Discovery date and time
- (b) Duration of event
- (c) Product Order reference information
- (d) Leased Fiber or other Facilities affected
- (e) Other information as requested by the Authority.

**2.0 Performance Interval.** The Service Interruption Credit time period begins after the Completion Interval referenced in Exhibit A (Fiber Specifications, Demarcation, Maintenance, Acceptance and Acceptance Testing), and ends when the Service Affecting Condition has been remedied.

- (a) If the start and/or end time of a Service Affecting Condition is in dispute, then it will be deemed that in all events a Service Affecting Condition begins at the time of Discovery notification by Lessee and, if such notice is not in writing, when Authority acknowledges receipt of the notice, and ends upon Authority giving the Lessee notice that restoration of the affected Leased Fibers has been completed.
- (b) Outage credits will not be credited or payable for any period of time during which Authority personnel or contractors are denied access to Facilities or other locations where access is the responsibility of the Lessee.

**3.0 Credit Dispute and Payment.** The Service Interruption Credit shall be in the amount of one day's equivalent License Fee for any part of the 24-hour period following the Completion Interval.

- (a) If the Service Affecting Condition event exceeds twenty-four (24) hours past Completion Interval, the credit shall be one days equivalent Lease Fee for each subsequent 24-hour period, up to a maximum of thirty (30) days equivalent Lease Fee.

- (b) All Service Interruption Credits for Lease Fees will be credited on, or added to, the next monthly invoice after receipt of Lessee's written request for credit.

**4.0 Service Interruption Credits Exceptions.** Service Interruption Credits do not apply to Service Affecting Conditions:

- (a) Caused by the negligence or acts of the Lessee, its agents, or its customers
- (b) Due to power failure
- (c) Due to the failure or malfunction of non- Authority equipment or systems
- (d) Caused by a Force Majeure event
- (e) During any period in which Authority is not given access to the Lessee's Facilities or other locations for which it is responsible for providing access
- (f) When Scheduled Maintenance is performed according to an approved MOP
- (g) When Scheduled Maintenance is performed on a single or unprotected Leased Fiber path unless otherwise provided for in a Product Order.

## Exhibit C Additional Product Order Process

**1.0 General.** The following outlines a process which the Parties agree to generally use, for the development of additional quotes and Product Orders. This process is not binding and neither Party shall be considered in breach of this Agreement for its failure to follow this process.

- (a) Request For Quote & Quote Response Process. At any time during the term of the Agreement, the Lessee may request from Authority quotations for additional fiber/s by utilizing the Authority Application Request process.

# Fiber Attachments

## A. GENERAL

This document is to outline the requirements for a non-Authority entity (i.e. Licensee) attaching fiber to Authority transmission structures (“structures”).

The guiding principles of this document and the requirements are:

1. Ensure public, utility, and contractor safety
2. Ensure unhindered reliability of the Authority’s system
3. Ensure Authority’s unhindered emergency response
4. Ensure no cost shifts to Authority’s electric and water customers
5. Ensure opportunities are maximized for customer service

Requests and review of underground fiber lines within Authority rights-of-way are not covered in this document.

## B. DESIGN

All attachments shall be designed and placed in accordance with the most stringent code requirements, specifications and regulations of NESC, OSHA and Authority’s Transmission Line Standard Reference Manual. This requirement addresses both clearance and strength specifications.

Licensee assets, installations, networks and customer service agreements making use of Authority infrastructure have secondary priority status (to that of the Authority) to utilize electric power transmission facilities owned or operated by the Authority.

### 1) **General Requirements**

- i. Licensee is to be responsible for any permitting required (railroads, SCDOT, etc.) to complete the proposed optical cable attachment.
- ii. Each structure may only accept a maximum of one (1) tensioned underhung fiber cable per structure.
- iii. The use of guys and/or intermediate structures should be avoided, however very limited use may be accepted following review and approval by Authority. Guys and/or intermediate structures should only be proposed as a ‘last resort’ when all other options have been exhausted.
- iv. Structure Attachments
  - Concrete Poles require stainless steel bands with stainless steel hardware
  - Weathering Steel and/or Galvanized Poles require drilling (no bands)
  - Wood Poles require drilling (no bands)
- v. Licensee Access Provisions

As required, Licensee infrastructure required to extend Licensee's fiber optic network to/from Authority transmission facilities on property owned or authorized for use by the Authority through Authority's existing easements should incorporate use of:

- Underground conduit/cable that is clearly marked with above-grade cable marker posts.
- Aerial pole line extensions that maintain adequate clearance from existing transmission facilities.

The design is split into two distinct but related phases subsequent to the preliminary request:

## 2) Feasibility Study

- i. The goal/purpose of the feasibility study is to exchange preliminary information with a potential Licensee regarding project scope, desires, constraints, limitations, alternatives, etc., in order to determine if a potential fiber project should move forward to a more detailed design phase. Authority will supply several documents to the Licensee, and the Licensee will in turn supply information to Authority for review and analysis.
- ii. Licensee Shall Supply:
  - a) Proposed line or lines to be affected
  - b) Detailed route with .kmz file, if available
  - c) Fiber optic cable manufacturer part number, specification, characteristics, etc.
  - d) Southwire File information (Chart Details information, Chart Code, Chart Coefficients
  - e) PLSCADD cable (.wir) file
  - f) Locations of any entrances/exits on/off the right-of-way
- iii. Authority Shall Supply:
  - a) Plan and Profile Drawings
  - b) Available encroachment information
  - c) GIS information
  - d) PLSCADD Model files (if available)
  - e) Encroachment guidelines
  - f) Transmission Line Standard Reference Manual (TLSRM)
- iv. Based on this exchange of information, Authority will conduct a high-level feasibility study. This will may be accomplished through a 3<sup>rd</sup> party consultant. The results of this feasibility study will highlight any constraints and identify any potential problems that may need to be resolved during the design phase. Typical information may include: high-level strength analysis of the structures, potential clearance violations or concerns, permitting requirements (road crossings, rail crossings, etc.), and a general high-level summary as to the overall feasibility of the project. The Authority will also provide high-level cost estimates of any make-ready provisions necessary to accommodate the installation.

- v. Based on the feasibility study, the Licensee may elect to proceed to a more detailed Design phase.

### 3) Design Review Phase

- i. The goal/purpose of the design phase is for the Licensee to proceed with a detailed design and prepare a design package that is suitable for construction, and that will be reviewed by Authority for adherence to applicable Codes and Standards (strength & clearance).
- ii. Licensee Shall Supply:
  - a) Detailed route
  - b) Final fiber optic specification, characteristics, etc.
  - c) Quantity and locations of any entrances/exits on/off the right-of-way
  - d) Quantity and locations of any appurtenances (splice enclosures, access points, conduit / cable service drops, etc.)
  - e) Plan and profile drawings showing fiber installation, sags and tensions, and values used for clearance verifications (MicroStation and PDF format).
  - f) Associated PLSCADD model files and criteria files
  - g) Final design package signed by a SC-licensed registered P.E. All drawings should be P.E.-stamped.
  - h) Structure strength calculations including subsurface/foundation analysis, P.E.-stamped. At a minimum items shall include but not be limited to the following:
    - i. Structure strength and subsurface analysis on a representative tangent structure. If a representative tangent (minimum 1 tangent / mile) fails (i.e. utilization >100%), additional tangents shall be evaluated, and mitigation measures identified.
    - ii. Structure strength and subsurface analysis on all dead-ends and angles impacted. Structure utilizations shall not exceed 100%.
    - iii. Mitigation measure to address any structural deficiencies.
    - iv. Note: if soil borings are not available, Licensee shall use conservative representative soil properties in the subsurface analysis.
  - i) Structure attachment drawings (MicroStation and pdf format), P.E.-stamped.
  - j) BOM
  - k) Licensee-installed conduit size and placement, both on the site and/or attached to the Authority structure, that is used to deliver Licensee's Facilities to Authority Facilities.
  - l) Location of all cable/conduit routing or aerial pole placement that is required for Licensee's Facilities to leave the property owned or authorized for use by the Authority.
  - m) Right-of-way encroachment request.
- iii. Licensee acknowledges that quantity, type and locations of the structures and facilities shown on any drawings transmitted should be field-verified for accuracy. This may or may not require the Licensee to conduct a survey of existing conditions.

- iv. Based on the submittal of the above information, Authority will conduct an engineering and design review for Code Compliance to include both structural strength as well as clearance. Authority will provide a written letter stating the results. This quality assurance review does not release the Licensee or their consultant from complying with the requirements of NESC, OSHA, Authority's Transmission Line Standard Reference Manual, and any other applicable codes.
- v. Prior to implementing fiber optic attachments, Licensee must present to Authority a finalized design package of each proposed attachment for review and approval in advance of construction activity commencement. Such package must include the specifications referenced in Section B.3.ii of these Fiber Attachment Design Requirements.
- vi. Following review of the design package, Authority will notify the Licensee of approval for the proposed attachment installation. Any modifications required by the Authority for the design package will be communicated and must be resolved by the Licensee prior to receipt of the approval letter.
- vii. The design package must include a complete construction schedule and is to include regular status reports as the project progresses (i.e. 30% / 60% / 90% or equivalent).

## **C. CONSTRUCTION**

### **1) Make-Ready Phase**

- i. The Authority shall exercise best available efforts to prepare the affected structures or lines, however it should be understood that this process is subject to seasonal availability of outages, and the schedule for this work is highly dependent on the actual lines affected, system conditions, weather, seasons, etc.

### **2) Contractors and Schedule**

- i. Licensee should share contract bidders with Authority PRIOR to bidding.
- ii. Contractor bidders should have demonstrated a capability to successfully complete similar projects on a high voltage system in the past. Minimum of (3) references should be provided.
- iii. Contract bidders shall be qualified, per all applicable Safety Standards (NESC, OSHA, ANSI, etc.) to work in the communications space, in close proximity to high-voltage electrical facilities.
- iv. Licensee should submit a construction schedule, as well as the name and contact information of the contractor. Amendments to this schedule should be shared as required to reflect all updates and changes.
- v. Authority reserves the right to review and approve / disapprove the contractors being asked to bid on the work as well as being used to perform the work.



### **3) Outage Coordination with Authority's Energy Control Center (ECC)**

- i. If outages of energized transmission facilities are required during construction or maintenance activities, Licensee shall prepare a step-by-step Sequence of Events (SOE) document and submit to Authority for approval.
- ii. Advanced notice of no less than sixty (60) days is required to coordinate a scheduled outage, however, other mitigating factors may restrict or prohibit granting outages for requested dates.
- iii. Upon approval, Authority will prepare required *Equipment Operations Request* (EORs) three (3) weeks in advance of requested outage date; typically (1) EOR for the entire construction duration will suffice.
- iv. Authority will prepare separate switching orders for each day for Hot Line Work Permits (HLWPs).
- v. Switching Tag Holder shall be documented as a 'C' (Contractor) within Authority's Switching Authorization Log. One-half day (½-day) training that addresses Authority switching procedures is required to receive credentials for switching authorization status.

### **4) Safety and Construction Oversight**

- i. Contractor shall have their own designated on-site quality, safety, and field representatives throughout the duration of the job.
- ii. Contractor shall have at least one on-site representative that is on site at all times during construction and that is trained via the contractor's switching class to have received the "C" designation (see C.4.v.) in order to obtain a hotline work permit from Authority's Energy Control Center. If the clearance are required, the contractor should coordinate with Authority's designated point of contact.
- iii. Contractor shall ensure its workers are qualified or non-qualified as defined by OSHA and NESC requirements for approach distances to energized conductors.
- iv. The following must be adhered to during construction:
  - (1) Abide by all OSHA and NESC requirements for approach distances to energized conductors. This applies to both personnel and the use of equipment around energized conductors.
  - (2) Hard hats and other appropriate safety gear shall be worn at all times.
  - (3) All ladders must have safety straps.
- v. All employees, agents, or contractors must be properly secured while working from ladders or buckets.

- vi. Authority representative will visit the site regularly during construction activities.
- vii. Issues or concerns identified during construction will be directed to the Licensee's Project Manager unless a safety issue which shall be addressed immediately/on-site.

### **5) Final Acceptance**

- i. Authority will perform final inspection and acceptance and develop a punch list of any needed items pertaining to the items listed below. Costs associated with this final inspection shall be billed to the Licensee.
  - a) Right of Way (cleanup, damages, etc.)
  - b) Fiber installation
  - c) Final easements
  - d) Project documentation
- ii. Failure to complete items noted on the punch list may result in the Authority undertaking this work and billing of such efforts at cost plus 30% to the Licensee.
- iii. Within sixty (60) days of installation, Licensee shall submit final as-builts (CAD files and PDFs) and copy of all design documents including Bill of Material ("BOM") (a list of major components used to construct) and drawings to the Authority.

## **D. OPERATIONS & MAINTENANCE**

### **1) Attached Fiber Maintenance by Licensee**

- i. Licensee must provide written notice to the Authority within sixty (60) days of maintenance. NOTE: Clearances on transmission lines are not always guaranteed and should not be assumed.
- ii. Licensee must not perform any maintenance that changes the approved configuration. Any changes must be reviewed and approved by Authority prior to installation and will, at a minimum, require updated as-built documentation.
- iii. Licensee will be responsible for any costs incurred and/or damage from interruptions on Authority's system resulting from the Licensee's maintenance and/or repairs to Licensee's Facilities.

### **2) Authority Inspection and Maintenance**

- i. Authority performs inspection and maintenance of all Authority owned assets on the joint transmission system.
- ii. Authority only inspects Authority assets. It is the responsibility of the Licensee to inspect Licensee's fiber assets.

- iii. Authority occasionally performs minor or major maintenance on transmission assets (i.e. minor repairs up to entire structure replacements).
  - 1. Minor maintenance. There should be no impact to Licensee assets during minor maintenance on Authority transmission assets.
  - 2. Major maintenance.
    - a) Authority will coordinate with the Licensee prior to any structure / transmission asset replacement. The purpose of this coordination will be to make the Licensee aware and have them scheduled to be on-site for asset transfer to the new structure.
      - During major maintenance Authority will replace the transmission structure. It will be the responsibility of the Licensee to be on-site and transfer their fiber asset (attachment) to the new structure. If Licensee cannot or is not on site to transfer attachment, Authority will transfer Licensee attachment – free of any liability – and bill the Licensee for transfer services, including the presence of a fiber consultant, as needed and to be determined by the Authority.
    - b) Any other asset modifications must be documented through updated as-built documentation by the Licensee.
- iv. It is the responsibility of the Licensee to perform any required maintenance to the Licensee’s fiber assets. Reference section D.1 for required notifications.
- v. Authority performs right-of-way maintenance based on electric service requirements. Authority will not perform any additional right-of-way maintenance associated with or because of Licensee infrastructure or assets.

## **E. FUTURE SYSTEM PLANNING**

### **1) New Construction & Rebuilds**

- i. If / when future transmission assets are planned to be added to the existing transmission right-of-way or require existing transmission assets to be rebuilt within the existing transmission R/W, it will be the responsibility of the Licensee to move, reconfigure, relocate or remove any assets that are attached to those impacted Authority transmission facilities if determined necessary to accommodate these efforts.
- ii. Authority will notify and coordinate with the Licensee during the planning phase of future transmission requirements, as applicable.
- iii. Licensee shall pay all associated costs for the transfer and movement of fiber attachments to new construction.

## **2) Reroutes**

- i. If / when existing transmission assets are required to be re-routed on new transmission R/W, it will be the responsibility of the Licensee to move, reconfigure, relocate, add or remove any assets as necessary to accommodate these efforts.
- ii. Authority will notify Licensee during the planning phase of future transmission requirements, as applicable.
- iii. Licensee shall pay all associated costs for the transfer and movement of fiber attachments to reroutes.
- iv. During any transmission line / asset re-routes, Authority will re-route the transmission line but will leave the Licensee's assets on the old structures. Following or in conjunction with the structure and line re-route, Licensee is responsible for transferring Licensee's asset to the new structures. This will be accomplished in conjunction with the Authority's work but no longer than thirty (30) days after the completion of the transmission asset re-route.
- v. Authority will remove the old structure(s) after thirty (30) days.
- vi. If Licensee fails to remove the old attachment(s) and re-attach to the new structure(s), Authority will remove Licensee's assets on the portion of the line that has been re-routed (i.e. old structures) which could leading to a service interruption. Authority will bill for those services and shall not be liable for any service interruption occurring as a result of Licensee's failure to act.

## **F. EMERGENCY RESTORATION**

Authority has a responsibility to provide electrical service to customers and as such will respond immediately to emergencies in order to restore service.

### **1) Response and Restoration to an Emergency Event**

- i. Authority will only respond to and restore transmission assets. The Authority will coordinate with the Licensee to schedule restoration efforts and it is the responsibility of the Licensee to respond to and restore any Licensee assets.
- ii. If Authority transmission line and/or Licensee assets are damaged during an event, electric service will take priority with respect to all restoration activities.

### **2) Damages from an Emergency Event**

- i. Authority will not be held liable for any damage to Licensee-owned assets.
- ii. Authority will not be held liable for any damages (including but not limited to lost wages, lost data, etc.) associated with the interruption of service due to damage to the Licensee's assets.

- iii. The Licensee will be responsible for all costs associated with any repairs or restoration to Licensee's assets.

**G. RESPONSIBILITIES AT END OF AGREEMENT**

- 1) Licensee is responsible for removing all assets owned by Licensee from transmission structures and those located on property owned or authorized for use by the Authority through existing easements.
- 2) Associated Licensee charges and expenses defined under terms of the Pole Attachment Agreement will continue to accrue until removal of Licensee's assets is complete.
- 3) Upon transfer of attachment ownership, Licensee shall notify Authority of new owner and provide new contact information, etc.