Questions and Responses to State of Vermont Request for Proposals "Construction of New Fiber Optic Cable Splice Enclosures" issued August 23, 2018. This document, issued September 14, 2018, includes responses to all questions submitted by the due date, August 31, 2018.

1. Will there be any new fiber optic construction, or will all of the splicing be performed on existing plant? If existing, will there be slack coils or will Celerity be required to move slack?

The locations of slack coils are depicted on the posted drawings.

2. Is all of the fiber currently in the communications space?

Yes, all fiber is in the communications space.

3. Section 2.3 Testing states that the Contractor will be required to test cabling upon completion of construction. Please advise the total number and locations of the Test Locations. Will the testing be unidirectional or bidirectional? Attach which wavelengths.

Testing will be conducted in accordance with the Contractors proposal. Each strand shall be tested bi-directionally @ 1310nm and 1550nm with an Optical Time Domain Reflectometer (OTDR) in accordance with TIA/EIA-568-B.1 and TIA/EIA-568-B.3. The PSD anticipates that the contract will include the applicable terms from a previous contract under Construction Requirements posted below.

4. Will the contractor be required to enter any existing cases or will all of the splice points require a new splice enclosure?

All spices will require new splice enclosures.

5. Should the Per-Enclosure Pricing assume that multiple splice points will be available per mobilization and the work can be completed in batch?

The PSD anticipates a contract for the installation of all splice enclosures in a single project.

6. Will all of the work be performed during normal business hours (7:00AM to 6:00PM) or will some of the splice locations require maintenance window work?

The PSD anticipates that the work can be done during normal business hours.

7. Upon reviewing the RFP there are a few attachments listed under #6. There should be a Price Schedule (6.3), Offshore Outsourcing Questionnaire (6.4), Two Workers Compensation forms (6.5 and 6.6) and an Econometric Modeling Questionnaire (6.7)

6.3 will the Scope of Work and Price Schedule proposed by the Bidder

6.4. Offshore Outsourcing Questionnaire
http://bgs.vermont.gov/sites/bgs/files/files/purchasing-contracting/Attachment-B.pdf

6.5. Workers' Compensation; State Contracts Compliance Requirement; Self Reporting
http://bgs.vermont.gov/sites/bgs/files/files/purchasing-contracting/contracts/Self%20Reporting%20Form%20-%20.doc

6.6. Workers' Compensation; State Contracts Compliance Requirement; Subcontractor Reporting
http://bgs.vermont.gov/sites/bgs/files/files/purchasing-contracting/contracts/Subcontractor%20Reporting%20Form%20.doc

6.7. Econometric Modeling Questionnaire
https://vtrans.vermont.gov/sites/aot/files/contractadmin/documents/Econometric%20Questionnaire.pdf

8. Paragraphs 1.1 and 2.2. It is not clear if the work is to replace existing enclosures or the creation of a new splice location to repair damaged cable. And if cable is damaged, will we also be required to rework slack along the route to gain enough cable at the damage to enable a splice?

The PSD seeks installation of many (hundreds) of new splice enclosures along a route of existing fiber optic cable. The PSD has no information about the condition of the cable which was installed in 2013. The vendor will be expected to repair and maintain the fiber as necessary to install the splice enclosures.

9. Paragraph 2.5 indicates that the cable is 144 strand ADSS cable. Is the all the cable installed on utility poles? For any portion(s) that are installed on utility poles is it installed in the power space between primary and secondary conductors?

The cable is installed on utility poles in the communications space.

10. Paragraph 2.5. ADSS requires cable specific hardware for attachment and splicing. Please provide a cable and hardware specifications.

See the attached drawings.

11. Paragraph 3.1 and 4.5. Do you have a pricing sheet or format you would like to the response in? You indicate that you are looking for "fixed retainer or hourly rates for service". However, the next sentence indicates "Pricing on a per-enclosure basis is required". The two statement contradict each other. Are you looking for a fixed unit price to conduct this work or do you want to accomplish it on a time & materials basis?

As listed in section 2.2(e), "The Department does not have a specified number of enclosures, but seeks to install as many as it can for the maximum amount of the capital appropriation." As such, the requirement of section 3.1 "pricing on a per-enclosure basis is required" is paramount. The PSD anticipates that prices for the repair and maintenance, potentially necessary to accomplish the installation, should be listed separately as a fixed retainer or hourly rates for services.

12. Is any of this work going to be emergency?

No, this project is to deploy new service, not restore existing service.

13. Is the existing cable active? Will we need to coordinate outages to accomplish the work?

Yes, there are several customers using the strands on the cable for long-haul transport.

14. Has the department identified all locations? Can pre-planning be done to schedule blocks of work to optimize work flow?

The splice enclosures will be installed near the slack coils depicted on the drawings. Deployment can be conducted as proposed by the contractor.

15. To confirm, this is for the 41 mile segment from Newport to Hardwick Only, correct?

The PSD anticipates that the majority of the enclosures will be installed on this segment. However, depending on the price per enclosure, and the requirements of customers seeking access, the splice enclosures may be installed at other locations along other State-owned fiber facilities in the North East Kingdom of Vermont.

16. When replacing these enclosures, would we be resplicing all fibers as well, or would we just resplice damaged/fibers in need of repair?

This project involves installation of new splice enclosures. Repair will only be necessary if inspection demonstrates that it is necessary.

17. I assume we are just responsible for the work on the 144f backbone cable, not the individual fiber drops to subscriber's homes, is this correct?

The PSD seeks installation of the splice enclosure and splicing and testing of the existing fiber. A separate company plans to lease this fiber from the PSD, and install new fiber drops to subscribers. This work, including splice work, is beyond the scope of this RFP.

18. Is there a splice loss standard you would have us abide by to determine which, if any, fibers required resplicing?

See Construction Requirements below.

19. Are there any splice locations that you know of that cannot be reached with a standard splice bucket van?

Respondents are directed to the posted drawings.

20. When you mention that we would make necessary repairs to the splices, does this include pole work, such as fixing slack storage, pole attachments etc?

PSD has performed annual inspections of the fiber. The vendor will be expected to repair the fiber as necessary to install the splice enclosures.

21. How much access do we have to places where we can test from?

It is the PSD understanding that the fiber can be accessed from the locations depicted on the posted drawings.

22. Do you have the specific cable part number so we can plan materials based on its size/weight/construction?

See posted drawings for specifications.

23. Is there any further documentation on the network, test results, foot marking charts etc?

Acceptance test results will be made available to the contractor upon request.

24. Is the RFP limited to the first 41 miles of the State's NEK network? If so, why?

The enclosures can be installed on any State-owned fiber in North East Kingdom.

25. Other than specifying that the Contractor shall "properly install all new fiber splice enclosures at the locations *as prescribed by the Department*," why does the RFP not mention the purpose of the fiber enclosures or mention the existing PLP Coyote ATC dual-chamber enclosures—mentioning only a Corning SCF-9T34-LRB?

The purpose of the splice enclosure is to enable customers interested in leasing the fiber from the PSD to deploy drops to consumers. Section 2.2(a) directs contractors to propose a splice enclosure model appropriate for the project, and the PSD listed one previously purchased model as a guide. The PLP Coyote ATC enclosure is also a compatible option.

26. Will selection of the Contractor be influenced by its willingness and ability to perform the tasks on a more timely basis than 12 months—with emphasis placed in the Craftsbury and neighboring towns section?

Vendor selection will be influenced by several factors, including price, qualifications, and schedule.

Construction Requirements

Construction Scope

All fiber optic cable to be installed along the aerial pole line shall be outside plant (OSP) 144-strand All Dielectric Self-Support (ADSS) single mode Corning fiber optic cable and will be installed at the approved space on the utility pole in the communications space. The project will encompass the complete installation of the fiber cabling from end to end where it will be tested from end to end for attenuation and continuity at 1310 nm & 1550 nm. Due to the nature of the build, the project will be broken into segments. Each segment shall be considered a complete segment for end to end testing.

1. The Contractor shall install ¼" EHS support strand and hardware as necessary to support the ADSS cable in spans that exceed the acceptable length for the ADSS cable provided as per the contract drawings. The ADSS cable shall be double lashed to the installed support strand.
2. All work is to be performed exclusively for the VTA, with final acceptance of all work, scheduling, coordination, etc. to be approved by the VTA. The VTA will not release any segment to any third party, until Contractor testing is complete.
3. The contractor shall coordinate all work through the VTA Project Manager.
4. The contractor shall prepare and submit a project schedule to the VTA Project Manager prior to commencement of project work.
5. Slack coils are to be installed for maintenance and/or future splice locations as indicated in the Fiber Optic Facilities Network Design VTA2011-124.
6. All fiber strands will spliced at designated splice locations along the route as noted in the Fiber Optic Facilities Network DesignVTA2011-124
7. All additional work (change orders) requires a written proposal by the contractor directed to the VTA project manager prior to the work being executed.
    a. Additional work shall not be executed by the contractor until written approval is received from the VTA.
8. The Contractor shall install slack cable in locations and quantities as indicated on the Fiber Optic Facilities Network Design.
    a. Slack cable shall be secured using VTA provided slack storage brackets.
    b. Slack locations identified as future FTTH Fiber Access Point (FAP) locations shall be relocated in future phases of this project.
    c. All slack relocation shall be coordinated with the VTA project manager.

Fiber Optic Cable Installation Requirements

The Contractor shall be experienced in fiber optic cable installation. The Contractor shall install new fiber optic cable and associated items according to the following:

1. As indicated on the Fiber Optic Facilities Network Design VTA2011-124 (Appendix 5).
2. All fiber optic cable to be installed along the aerial pole line shall be outside plant (OSP) 144-strand All Dielectric Self-Support (ADSS) single mode fiber optic cable.
3. All fiber optic cable shall be installed as per manufacturer's best practices and tensioned and as per manufacturer's specifications. The Contractor shall refer to Corning Standard Recommended Procedure 005-038 /Issue 6 / September 2010 (Appendix 3). (This procedure provides general information for installing all Corning Cable Systems Solo® ADSS All-Dielectric Self-Supporting fiber optic cables from 2-288 fibers).

4. The Contractor is responsible to install all necessary pole hardware suitable for the provided cable.

5. High visibility cable tags or markings shall be installed at every splice enclosure and be visible while standing on the ground.

6. All fiber optic cable installed beyond 50LF of the building entry must be transitioned to plenum rated cable, as called for by engineering drawings when applicable.

7. The mechanical and environmental specifications for inside plant (ISP) optical fiber cable shall be in accordance with ANSI/ICEA S-83-596.

8. All ISP fiber cables are to be installed as per Article 770 of the National Electric Code and any applicable local, State or County codes having precedence. The fiber cable must be protected by a metal shield or metal conduit at any point where the cable could be accessed by the public. The protection must be maintained at least 10 ft. above grade. Any underground work must withstand water or condensation.

9. Industry approved cable lubrication shall be used as required during cable placement in innerduct or conduits.

10. At each aerial splice location 100 feet of cable will be left on each cable end for splicing or as otherwise indicated on the construction drawing. The cable ends must be sealed watertight at all times to prevent water from entering the cable.

11. The Contractor shall coordinate all building access with the VTA project manager prior to cable installation.

Staging Area Requirements

1. The staging area for this project will be an operational working garage for the Vermont Agency of Transportation (AOT) at Thetford, Vermont.

2. Trucks and heavy equipment are in use. Care should be taken not to interfere with AOT's daily operation.

3. An area has been designated for use by the AOT Personnel for the compound for storage of fiber reels and project related materials. The Contractor is responsible for maintaining this area for the duration of the project and securing the materials.

4. The Contractor will be issued a key and will be responsible for securing the gate at the end of each day.

Applicable Codes and Standards

1. The Contractor shall be familiar with and install all materials in accordance with all applicable codes and standards, including NEC (NFPA 70), NESC, ANSI/EIA/TIA 568A, 569A, 606, 607, BICSI, TDMM, OHSA and any other applicable federal, state and local codes and authorities having jurisdiction.

2. The Contractor shall accomplish all cutting, removal and replacement of ceiling tile, drilling, coring and patching of walls, floors and ceilings required to complete the work in a neat and orderly fashion, as per engineering drawings.

a. All disturbed surfaces shall be restored to like new condition.

b. All repairs shall match existing finish.

3. The Contractor, in accordance with all applicable codes, shall provide fire and smoke stopping through all rated smoke and fire partitions.

4. Cable entry into rooms shall be via the provided access holes, where available.

a. Any additional cutting/drilling into the drywall construction should be minimized.

b. Penetrations required by the contractor will utilize ¾" minimum metallic sleeves properly smoke/fire stopped.

5. All new facilities, including cables, splice closures, termination panels and splice trays shall be labeled at the time of installation.

a. All cables must be labeled and documented at each end and the entry point of each specified building.

b. All slack cabling left for maintenance must meet all labeling requirements for outdoor use.

c. Labeling practices shall be consistent across the installation.

6. Adhesive labels shall meet the legibility, defacement, and adhesion requirements specified in UL969 for indoor use.

a. Indoor cable labels shall have a durable substrate, such as vinyl, suitable for wrapping.

7. Exterior labels shall be embedded characters on cable tags and shall be attached to the cable via plastic cable ties. VTA will supply the labels.

a. Cable tags shall be non-indelible, resistant to chemicals, and designed to withstand exterior environments.

8. Fiber cable tags shall be orange and shall state "FIBER OPTIC CABLE". Fiber cable tags to be supplied by the VTA

Fiber Optic Cable Splicing Requirements

1. All fibers and connector assemblies (pigtails) shall be fusion spliced.

a. All splices are to be organized and secured within an approved fiber optic splice closure.

b. The Contractor shall follow the manufacturer's recommended cable preparation and routing procedures for cable entry into the provided fiber optic splice closure.

2. All splicing shall be completed as per splice details provided for each identified splice location.

a. Any changes shall be approved by the VTA Project Manager prior to completion.

3. The Contractor shall maintain a Splice Log Book for each splice enclosure.

a. Each splice enclosure will have a unique identifier as per the design prints and shall be large enough to be visible from the road. The splice enclosure identifier shall also be referenced on the Splice Log Book cover.

b. The Splice Log Book shall include a copy of the original splice detail sheet, a red-lined copy of the as-built detail, LID readings from the fusion splicer, pictures of the organization and layout of the interior of the enclosure, and pictures of the enclosure on the cable or strand.

c. The Splice Log Book shall also include any additional pertinent information not listed. An Electronic copy shall also be provided.

4. All splicing shall be monitored with an OTDR and tested to ensure acceptable splice loss values are achieved.

5. All tools and equipment used shall be in excellent working order.

a. The Contractor's cleaving, splicing and cable preparation equipment will be reviewed and approved by the VTA or its representatives prior to beginning any splicing work.

b. All splicing equipment shall be calibrated within 6-months of use on this project.

c. Certificates of calibration for splice equipment shall be submitted to the VTA project manager for review and approval.

Fiber Optic Cable Testing Requirements

1. The Contractor shall test all optical fiber cables in accordance with the Contractors proposal, upon receipt at the project site prior to installation.
2. Optical fiber cables shall be tested while on reels with an Optical Time Domain Reflectometer (OTDR) to verify the cable length and locate cable defects, splices, and abnormalities, recording the loss value of each.
3. The Contractor shall compare all pre-installation reel test data with factory results provided by the cable manufacturer and report any deficiencies.
4. The contractor shall retain pre-installation reel test data and include the record with as-built data.
5. All completed fiber spans shall be acceptance tested to determine cable length and splice attenuation using an OTDR. Each strand shall be tested bi-directionally @ 1310nm and 1550nm.
6. Each strand shall be tested for end to end dB loss and continuity using a Single mode light source and power meter@ 1310nm and 1550nm. Provided that the ends of the fiber are terminated.
7. Optical fiber end-to-end link tests shall be performed in accordance with TIA/EIA-568-B.1 and TIA/EIA-568-B.3.
8. The contractor shall prepare loss budget calculations for each strand and location. The loss budget shall itemize expected dB loss. The following formulas shall be used:

i. Measuring at a wavelength of 1310 nm:
ii. _____ km X .50 dB/km = _____
iii. _____ SC connectors X 0.4 dB/mated pair = _____
iv. _____ Splices X 0.05 dB = _____
v. _____ Total maximum (end to end) loss = _____

vi. Measuring at a wavelength of 1550 nm:
vii. _____ km X .40 dB/km = _____

viii. _____ SC connectors X 0.4 dB/mated pair = _____

ix. _____ Splices X 0.05 dB = _____

x. _____ Total maximum (end to end) loss = _____

9. Strands shall meet current EIA/TIA-568 specifications.

10. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.

11. The Contractor shall correct any fiber strands that demonstrate excessive attenuation due to breaks, bends, bad splices, defective connectors and bad installation practices.

12. The VTA will direct the contractor on how to proceed about the fiber spans that do not meet specification for OTDR splice attenuation, link loss or other short falls.

13. The contractor shall perform any repair required by the VTA to correct any deficiencies, at no additional cost to the VTA, provided that the repair is due to the Contractors work

14. The Contractor shall submit test result in electronic format on a labeled CD and in hard copy to the VTA project manager for acceptance and sign off.

15. All test equipment used shall be in excellent working order.

a. The Contractor's optical test equipment will be reviewed and approved by the VTA or its representatives prior to beginning any splicing work.

b. All testing equipment shall be calibrated within 6-months of use on this project.

c. Certificates of calibration for optical test equipment shall be submitted to the VTA project manager for review and approval.

Documentation Requirements

1. The Contractor shall prepare and submit to the VTA, in reproducible form, all As-Built drawings, network and cable diagrams, Splice Log Books and any other pertinent information relating to the installation of the fiber optic network as required by this document, prior to submitting the final billing invoice for payment.

2. Final billing payment will not be made if this information is not provided as requested.

3. Invoicing should occur after each deliverable is submitted on a per Project basis, and job completion criteria are met, VTA will consider partial payments on specific tasks.

4. The Contractor shall maintain documentation for all hours, supplies, and leased special purpose equipment for the Project; Design plans; As-Built drawings; Reel Documentation and test data, Fiber Organization Drawing, fiber testing, end to end, for attenuation and continuity. OTDR results, and Change Orders and Project files (adds, moves and changes) supporting all payments and the As-Built drawings.

5. The Contractor shall maintain a Log Book for each splice enclosure. Each Splice Enclosure will have its unique identifier as shown in the Fiber Optic Facilities Network Design, Splice Point Data Block, and shall be referenced on the Log Book cover. The Log Book shall include the As-Built Drawing, a record of Adds, Moves and Changes, Drawings of the Fiber Management Organization for the enclosure, Splice Cut Sheets, Splice Loss, OTDR Test results and pictures of the organization and layout of the interior of the enclosure and placement of the enclosure on the cable. The log Book shall also

include any additional pertinent information not listed. The Contractor will submit each log book as part of deliverables to the VTA.

Job Completion

In addition to the job completion requirements in the contract, Contractor shall submit its last invoice, notify the VTA that construction is complete and final inspection has occurred, certify that all punch list items have been completed, and deliver all construction materials and fiber reels have been returned to the VTA staging area with a list of remaining items. Before final payment Contract shall deliver to VTA all documentation for the Project including but not limited to Design, As-Built, Reel Documentation and test data, Fiber Organization Drawing, fiber testing, end to end, for attenuation and continuity, OTDR results, and each individual Splice enclosure Log Book.

Safety Requirements

1. All Contractor personnel shall be thoroughly familiar with all applicable Occupational Safety and Health Act (OSHA) regulations, the National Electric Safety Code (NESC), state and local regulations, and Vermont's Agency of Transportation safety practices and policies.

2. Until the project is complete, maintenance and protection of traffic is the responsibility of the Contractor and shall be furnished, installed and maintained in accordance to the governing agency's traffic control details and as specified by the VT Agency of Transportation. Traffic control is to be billed to the VTA at pass through cost.

3. Adequate signs and safety cones to maintain a safe working environment shall be supplied by the Contractor, deployed prior to daily work efforts and removed at the end of each day unless site conditions warrant otherwise.

Warranty Requirements

1. The Contractor shall warrant that all materials furnished shall be new, and free from defects.

2. The Contractor shall warrant that the materials and workmanship used in this installation are as herein specified, and shall provide all material and labor required to make good any defects due to faulty materials or workmanship which become apparent within a one year period from project completion.

3. The equipment and materials manufacturers are expected to recognize that they are responsible for the failure of their products to perform in accordance with data furnished by them or their authorized representatives, as well as misrepresentations of such data.

    a. When the products have been installed in accordance to the manufacturer's published or written instructions and recommendations, and such products fail, then the contractor and the manufacturers are responsible for replacement of the products and all associated work and materials without additional cost to the VTA.

4. Warranty information is required for all materials supplied by the Contractor.

5. Damage by vandals, fire, traffic accidents, third party activities or "acts of God" is excluded from warranty.