

## **REQUEST FOR PROPOSALS:**

### **CVFIBER DISTRICT HIGH-LEVEL DESIGN (NON-WEC AREA) AND CVFIBER DISTRICT DETAILED ENGINEERING**

#### **1. INTRODUCTION**

CVFiber is seeking to contract for a High-Level Design for its FTTP network for the remaining 450+- miles of non-WEC distribution territory in the CVFiber District, and, as poles' data and funds become available, incrementally for detailed engineering for the entire District.

The intent of this RFP is to ensure that there is a wholistic design for the entire District and that it is compatible with the WEC high-level-design, which has a separate RFP. See: <https://cvfiber.net/2021/05/wec-and-cuds-issue-high-level-design-rfp/>

#### **2. THE NON-WEC AREA**

The non-Washington Electric Cooperative areas in the CVFiber District are the areas served primarily by Green Mountain Power (GMP), Hardwick Electric, and Morrisville Electric. Appendix A shows a map of the area in which additional broadband infrastructure will be deployed. At this time there is no pole inventory information available for towns of Elmore and Woodbury.

#### **3. PROPOSAL INFORMATION**

All communication with regards to this proposal will be in the form of emails. Other forms of communication, specifically telephone calls or text messages will not be accepted.

The CVFiber review committee reserves the right to:

- Accept or reject any or all responses, or any part thereof;
- Waive any informalities or technicalities contained in any response received;
- Conduct discussions with respondents and accept revisions of proposals after the closing date;
- Make an award based upon selection criteria defined in this RFP;
- Request clarification from any respondents on any or all aspects of its proposals;
- Cancel or re-issue this RFP at any time;
- Retain all proposals submitted in response to this RFP; and/or
- Invite some, all, or none of the respondents for interviews, demonstrations, presentations and further discussion.

#### 4. CALENDAR

May 17, 2021	RFP Issued
May 24, 2021 @ 5:00 PM	Last day of respondent questions submitted via email
May 26, 2021 @5:00 PM	Answers to all questions distributed and posted
June 2, 2021 @ 5:00 PM	RFP Responses submitted via email
June 11, 2021	Interviews complete
June 16, 2021	Response selection

#### 5. CONTACT INFORMATION

Please send all questions and RFP responses to [CVF-HLD-RFP@googlegroups.com](mailto:CVF-HLD-RFP@googlegroups.com).

#### 6. VENDOR INFORMATION

- a. Vendor name, address, telephone number, email and website
- b. Submission contact person: name, title, phone numbers and email address
- c. Company overview, including a brief history, mission, number of employees, and number of years in operation.
- d. If an independent consultant: your full name, address, phone number, email, and years working as an independent consultant.
- e. Describe the percentage of municipal, non-profit, and commercial clients.
- f. Two recent references concerning your experience with the work described in this RFP. Indicate the reference's name, a brief description of the services provide, and the name, title and contact information.
- g. The selected vendor will carry liability insurance in the amount of one million dollars (\$1,000,000) per occurrence, errors and omissions insurance in the amount of one million dollars (\$1,000,000), and worker's compensation insurance as required by law. The selected vendor will provide Certificates of Insurance as a condition of acceptance.

#### 7. HIGH-LEVEL DESIGN SCOPE OF WORK

This Scope of Work is identical to the WEC-CUD Partnership's Scope of Work. Contractor will create and deliver a high-level XGSPON FTTP network design. The high-level design shall conform to the technical standards in Appendix B and shall specify the suggested locations of the central nodes, the cable routes that would extend the XGSPON network from these nodes to the service area, the sizing of the fiber optic cable necessary to provide current and future capacity to serve all premises, connectivity from central nodes to middle mile and long haul needs of the network, and capacity for growth and performance (speed) to serve the areas within the towns not served by WEC.

- a) The design shall include the following current CVFiber member communities: Barre Town, Barre City, Berlin, Cabot, Calais, Duxbury, East Montpelier, Elmore, Marshfield,

Montpelier, Middlesex, Moretown, Northfield, Orange, Plainfield, Roxbury, Washington, Williamstown, Woodbury, Worcester.

- b) The design shall include excess fiber strand to accommodate whole town design.
- c) Without sacrificing future performance, the high-level design shall minimize build and operating costs and shall optimize use of existing aerial routes but may include limited lengths of underground routes.
- d) Incorporate available existing fiber assets including First Light, VELCO etc., where their use is feasible, and any known passive infrastructure that could be leased rather than built new.
- e) To the degree possible, situate electronics in proximity to government buildings or near areas of greater population density.
- f) Clearly describe a strategy and rationale for design architecture.
- g) Describe anticipated required permits and civil works, along with estimated costs.
- h) Include OLTs and ONTs in quantities and locations that are consistent with technology constraints, strand counts, and population densities. The design shall also specify the proposed service area and capacity for each OLT.
- i) Divide the initial service territory into Fiber Service Areas and shall provide approximate types, costs, and locations of other gear needed to provide services such as splice cases, MSTs, splitters, hand holes, and other types of material that may be required.
- j) Be expandable in a manner as efficient and effective as possible to increase capacity and to accommodate advances in technology as may reasonably be expected to become available over the life of the network (at least 20 years). The design should include sufficient fiber capacity in the backbone and distribution routes to accommodate potential future expansion.
- k) Adhere to all current and generally accepted technical standards, building codes, construction practices, and other regulations, specifications, and standards as may apply in the broadband networking industry.
- l) Clearly indicate strand counts for each discrete cable specified.
- m) Provide an estimated bill of materials including labor, and materials, including all active and passive equipment with quantities and capacities (where applicable) provided for each item, along with one-time and recurring expenses, such as maintenance, repair, and replacement.
- n) When completed be based in a Geospatial Information System and shall be provided in a format that can be integrated into other (ESRI) GIS systems. A numeric version of the design, listing lengths, quantities, and other specifications shall be provided in a format that is readable by Microsoft Excel. Two full sets of architectural D size scale drawings subject to Owner approval shall be provided.
- o) The successful vendor shall include 14 hours of technical support services to facilitate interpretation of the completed high-level design and support Owner's next infrastructure deployment steps.

## 8. DETAILED NETWORK ENGINEERING PLANS SCOPE OF WORK

Following completion and acceptance of the high-level design, the same contractor shall incrementally develop detailed network engineering plans for the CVFiber District, as poles' data and funds become available, in a series of Work Orders pursuant to CVFiber Requests for Bid.

The Phase One Project is approximately 300 miles, serving about 4,250 premises. A detailed pole inventory will begin in June and should be completed by August 2021.

The detailed engineering elements are as listed below. The Design/Engineering process includes all necessary elements for the construction team to build the network.

Respondent should indicate what other elements should be added to this list and the reason therefor.

- Hub Agreements,
- Detailed Engineering construction specification, drawings, maps and splice charts
- Network electronics.
- Physical infrastructure and environmental systems necessary to house and support the network electronics.
- Fiber connections to customer premises (“drops”).
- Customer premises equipment and cabling.

See Appendix C for Detailed Design and Engineering Specifications

## 9. EVALUATION CRITERIA

- a. Municipal Broadband Experience and Capacity (25%)
- b. Client List and References (25%)
- c. Pricing (50%)

## 10. PRICING

Include a per-mile high-level design and detailed design and engineering rates in the event additional towns are added to the network. The rates must be valid for a minimum of one calendar year from the date of selection, and the response must specify the proposed inflation-related adjustment after that period. A firm fixed price is preferred, including requirements collection, design, documentation, and support.

Where appropriate, include list prices and discounted prices. If licenses are involved, provide sufficient detail that will allow informed decision making.

## 11. FORM OF PROPOSAL

- a. Introduction
- b. Scope of work narrative
- c. Compliance statement
- d. Timeframe to complete the work
- e. Caveats, assumptions, if any
- f. Vendor background and qualifications
- g. Narrative description of relevant experience
- h. Three references including contact information
- i. Pricing

## APPENDIX A

Materials provided:

ArcGIS Project Package (v2.7) with the following symbolized data:

- WEC Poles
- WEC Lines
- WEC/Other Utility Substations
- VELCO Fiber Network
- E-911 Occupied Sites
- Roads
- Town Boundaries
- CUD Boundaries
- WEC Boundary
- GMP Poles
- GMP Lines
- Potential HUB Locations

Contractor can also download data from the Vermont Center for Geographic Information at <https://geodata.vermont.gov/>

[map]

## **APPENDIX B HLD TECHNICAL SPECIFICATION**

1. Ten-Gigabit Passive Optical Network (XGSPON) architecture for residential and small business use.
2. WEC pole location data and substation locations will be provided in a GIS format. The high-level design should attempt to follow pole paths to the extent possible with potential underground segments where there are no usable pole lines. Premises locations will also be provided in a GIS format.
3. Four or more spare fiber strands set aside for future direct connections from local hubs to serve large commercial businesses or to provide service to cell towers.
4. Sharing of optical feeder and port on the Optical Line Terminal (OLT) among as many subscriber terminals as possible, typically 28 subscribers per OLT port plus 4 spares.
5. Attachment of distribution fiber and customer drops on existing utility poles located at the roadside or in easements on private property.
6. Passive optical splitters to terminate the fiber and provide the optical connection to the Optical Network Terminal (ONT) at the customer premises.
7. Not less than two (three would be better) central hub locations to provide routing redundancy, one each in Southern and Northern areas of the District.
8. Local hub locations in many member towns as determined by distance requirements and the number of required local connections. If desirable, hub can co-locate at the electrical substation.
9. Generator availability at hub location and not less than 8 hours of battery back-up in each hub.
10. Optical line terminals (OLT) in each hub connecting to splitters in the field and connecting to each other in a ring topology.
11. Diverse and redundant connections to backhaul providers and concentration to ensure resilient connection to the internet.
12. Ensure the electrical substations are on the network.
13. Diverse backhaul connections to major co-location centers in two to three cities with sufficient upstream capacity and peering arrangements to support the peak load of fiber customers plus 20%.
14. Connections to the premises and installation inside each premises at nominal cost, provided that the connection from the nearest utility pole is aerial and up to 400 feet in length. The network design will have sufficient flexibility to support substantial economic growth and a corresponding increase in the number of occupied premises by overlashing additional fiber from the hub to the additional locations and/or shortening the distance between splitters.



## **APPENDIX C DETAILED DESIGN AND ENGINEERING SPECIFICATIONS**

Following completion and acceptance of the high-level design, the same contractor shall incrementally develop detailed network engineering plans for the CVFiber District, as poles' data and funds become available, in a series of Work Orders pursuant to CVFiber Request for Bids.

The detailed engineering elements are as listed below. The Design/Engineering process includes all necessary elements for the construction team to build the network.

Respondent should indicate what other elements should be added to this list and the reason therefor.

- Hub Agreements,
- Detailed Engineering construction specification, drawings, maps and splice charts
- Network electronics.
- Physical infrastructure and environmental systems necessary to house and support the network electronics.
- Fiber connections to customer premises ("drops").
- Customer premises equipment and cabling.

### a. Identify Hub Locations

The selected contractor shall develop a detailed plan and costs for hub locations (optical line terminals (OLT), power supply, and battery back-up, possibly including an emergency generator) that meet the need of the first project build and that achieves the overall goal of reaching every premise in every town within the District. The Central Hubs also include internet routers and sometimes network switches.

### b. Hub Agreements and Easements

The selected contractor will be responsible for developing the leasing agreement between CVFiber and each town/school/public safety and other relevant network to put hub equipment in their building.

### c. Detailed Construction Drawings and Maps

The selected contractor will create detailed construction maps in an electronic (preferably in an ArcGIS format) and paper format for the Construction team and for long term system management.

Firm shall develop the specifications for putting the construction of the network out to bid and work with the Planning and Development Committee in the selection of the contractor.

d. Fiber Distribution Network Construction Oversight

The selected firm shall be responsible for ensuring the construction of all network infrastructure conforms to the network design and engineering specifications and resolving issues as they arise.

The network construction shall include the following:

- Procurement of materials and labor required to construct fiber distribution network.
- Applications for utility make-ready as required.
- Pole review with utilities.
- Pole make-ready coordination if not already completed.
- Application for pole licensing as necessary and not already completed.
- Application for highway and railroad permits.
- Traffic control.
- Exterior construction of fiber distribution network based on engineering design.
- Construction and installation of physical infrastructure and environmental systems for network electronics including cabling connections as specified.
- Physical installation of network electronics.
- Validation and Optical Testing
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e. Bill of Materials

The selected contractor will develop a Bill of Materials generated from the network design and engineering. Materials will include strand (steel messenger cable to which fiber is overlashed), fiber, splits, hardware, splitter, and fiber access point cases, OLTs (Optical Line Termination), additional electronics, etc.

f. Construction Map Validation

The construction maps should be validated in the field to ensure all elements are correct and all premises are included in the design.

g. Network Construction, Quality Control, and Testing

The Contractor shall develop and maintain a schedule for completion of the route, providing weekly updates to CVFiber's Project Manager. Using detailed engineering/design and construction mapping and materials and having secured the proper permitting, construction will begin. The contractor shall provide a description of the steps involved in testing and acceptance of the construction of the network.

- Network hub and central hub construction
- Needed hub agreements and easements in place.
- Placing fiber along the route, splicing fiber at splitter locations, fiber access point locations, etc., and terminating fiber in the hub locations
- Testing - the light levels of network fiber should be tested for quality before activating the network.
- Inspection - the fiber network should be inspected for quality to ensure the construction maps are being followed and all elements are correctly in place.
- Construct hub locations and place hub cabinets. Install necessary equipment at hubs and central hubs (OLT, routers/switches, etc.)
- Procedure for handing off completed construction to CVFiber's proposed operator.

Any additional steps contractor believes are essential for initiating and completing the projects.