Request for Proposals
For
Installation of a Fiber Optic Network

Stillwater Electric Utilities
A Division of the Stillwater Utilities Authority
City of Stillwater, Oklahoma

Dated: August 24, 2015
Pre-proposal Conference: September 8, 2015
Proposals Due: September 28, 2015

1.0 Purpose:

The Stillwater Electric Utility (SEU) is seeking proposals for the installation of a secure and reliable fiber optic network to establish connectivity between a new power generation plant and several electric substations in the northern part of the City of Stillwater, Oklahoma to support Supervisory Control and Data Acquisition (SCADA) communications. The network will also connect the new Power Generation Station (PGS) and substations to the City's primary data center, on isolated pairs, for general voice and data communications, and provide storage access points for future connections planned in the northern part of the City.

The installed network shall be a turnkey system, ready for transporting data between the specified locations upon completion. It shall include, but not be limited to, the installation of fiber optic cabling, splice-cases, cable storage systems, patch panels, communications racks, and network switching and routing equipment.

2.0 Scope of Work:

2.1 Overview:

With assistance from consultants, the City has developed plans for a dual-ring fiber optic network consisting of northern and southern loops with various spurs to key facilities. This proposal is solely for the construction of the northern loop, spurs to associated electric utility locations along the northern loop, a spur to the City's primary data center, and 7 storage access points for future connectivity from the northern loop. Proposals for the southern loop and associated spurs may be solicited at some time in the future.

As shown in bright green on the map provided on page one of Attachment 1, the primary loop consists of approximately 12 route miles of fiber. Spurs from the loop, shown in red on the map, total approximately 2 more route miles of fiber, which brings the estimated total for the project to approximately 14 route miles. These estimates do not account for slack required for splicing, termination and future maintenance, or the requested access points for future connectivity.

2.2 Fiber, Poles, and Pole Attachments:

The fiber is expected to be almost exclusively aerial and hung on wooden utility poles owned by the City. There may be a few steel or fiberglass poles on some routes and some pulls underground or through conduits to enter into buildings, but the vast majority of the installation will be aerial on wooden poles. All pole attachments shall be rated for heavy loading. The approximate pole count along the designated paths is 500. Fiber must be attached to every pole it passes, and shall be consistently mounted on the same side of the pole. Aerial maps of the proposed routes can be provided upon request.

To avoid the need for additional down guys and potential issues with co-locating in the telecommunications space, all fiber is expected to be hung in the 'Extended Reach' corridor, six inches below the lowest neutral conductor. Therefore, the fiber shall be All-Dielectric Self-Supporting (ADSS) cable, and installers must be qualified to work in the 'Extended Reach' space. To maximize transmission speeds and distances and the ability to take advantage of future advancements, all fiber shall be single-mode. The primary loop shall have no less than ninety-six (96) strands, and spurs shall have no less than forty-eight (48) strands.

2.3 Locations To Be Connected:

The following table shows the name and address of locations to be connected to the network. The table also indicates if the location is directly on the loop, is a spur, or is a future access point. On the loop means that all strands of the loop enter and exit the location. All incoming and outgoing strands are to be fully terminated in patch panels at the location. Spurs shall have half of their strands spliced to the loop as incoming strands and half as outgoing strands with all strands terminated accordingly in patch panels at the specified location. Access points shall be within 250 feet of the specified locations. All access points shall have an adequate amount of storage to allow for future splicing (e.g. 300 feet or more).

Table 2.3.1

Name	Location	Connection Type	Spur Connection Point
New Power Plant	2000 E. Airport Road (Due West of Ferguson Substation)	On Loop	N/A
Industrial Substation	4220 N Perkins Rd	Spur	4220 N Perkins Rd
Access Point #1	Perkins Rd & Richmond Rd	Access Point	N/A
Access Point #2	Washington St & Richmond Rd	Access Point	N/A
Access Point #3	Washington St & Airport Rd	Access Point	N/A
Access Point #4	Washington & Liberty Ave	Access Point	N/A
Boomer Lake Station (BLS)	720 W Lakeview Rd	Spur	Boomer Lake Station Sub
Boomer Lake Station (BLS) Substation	SE Corner of Boomer Lake Station	On Loop	N/A
Access Point #5	N Boomer Rd & Husband Rd	Access Point	N/A
Central Substation Switch House	411 E 3rd Ave	On Loop	N/A
Central Substation	Due North of Central Substation Switch House	Spur	Central Substation Switch House
City Data Center	723 S. Lewis St	Spur	Central Substation Switch House
Access Point #6	Stallard St & Third Ave	Access Point	N/A
Access Point #7	Jardot Rd & Sunrise Ave	Access Point	N/A
Ferguson Substation	3700 N Jardot Rd	Spur	New Power Plant Admin Building
North Tap Substation	5401 N Jardot Rd	Spur	New Power Plant Admin Building

2.4 Switching and Routing:

Layer 2 switching and Layer 3 routing equipment is required for connectivity between locations on the network. All electronics for SCADA communications and substation automation will be provided by the SEU and the SEU's SCADA system vendor, but respondents shall recommend and provide switching and routing equipment (City Network Devices) at each location for general data communication links to the City's network. City Network Devices will be independent from the SCADA equipment and connected to separate, isolated fiber pairs.

The City of Stillwater currently utilizes Cisco equipment for most networking requirements and prefers it for all Layer 3 equipment installed in commercial environments. The City will, however, accept other name-brand networking equipment recommendations for substations as long as they clearly meet environmental specifications, support all modern switching and routing standards, and have superior 24/7, U.S.-based product support and warranties. Any licenses required to access full functionality of the switches and routers, both commercial and industrial, must be included.

Ideally, City Network Devices will have both fiber and copper ports, or SFP interfaces allowing for selection of media type. City Network Devices shall have an adequate number of ports of each type for interconnecting existing locations, and a considerable number of spare ports of each type to allow for future connections. Respondents are expected to submit network design proposals indicating what they consider to be the optimum network topology, but the table below is provided to give direction on where hardened, industrial-class devices will be required and the desired present and future link speeds between locations.

Table 2.4.1

Location	Environment	Peer Location / Link Speed
New Power Plant	Commercial	10 gigabit to Central Sub Switch House and City Data Center with the option of going 40-gigabit to these locations in the future. 1-gigabit to all other locations.
North Tap Sub	Industrial	1-gigabit to New Power Plant and all other electric utility locations with the option of going to 10-gigabit in the future.
Ferguson Sub	Industrial	1-gigabit to New Power Plant and all other electric utility locations with the option of going to 10-gigabit in the future.
Industrial Sub	Industrial	1-gigabit to New Power Plant and all other electric utility locations with the option of going to 10-gigabit in the future.
Boomer Lake Station Sub	Industrial	1-gigabit to New Power Plant and all other electric utility locations with the option of going to 10-gigabit in the future.
Boomer Lake Station	Industrial	1-gigabit to New Power Plant and all other electric utility locations with the option of going to 10-gigabit in the future.
Central Sub	Industrial	1-gigabit to New Power Plant and all other electric utility locations with the option of going to 10-gigabit in the future.
Central Substation Switch House	Commercial	10 gigabit to City Data Center and New Power Plant with the option of going 40-gigabit to these Locations in the future. 1-gigabit to all other locations.
City Data Center	Commercial	10 gigabit to Central Sub Switch House and New Power Plant with the option of going 40-gigabit to these Locations in the future. 1-gigabit to all other locations.

2.5 Splicing and Termination:

All strands shall be fusion-spliced at naturally occurring splice points. Splice cases shall be adequate in size to support all strands of the primary loop and a minimum of forty-eight (48) additional strands for future tie-ins. The splice case for Access Point #2 shall accommodate the ninety-six (96) strands of the primary loop, plus two additional cables for future connectivity, a ninety-six (96) strand cable and a forty-eight (48) strand cable. All splice cases and associated slack shall be brought down from the 'Extended Reach' corridor and mounted on spool racks attached to the pole twelve (12) to fifteen (15) feet above the ground where they can be reached by ladder. Designated future access points and any other recommended or required slack loops shall be installed in the same manner.

Rack mount patch panels are preferred whenever possible. SEU is not requiring a particular fiber connector type for patch panels, jumpers and switch gear, but the type shall be consistent throughout the project, and respondents shall provide an explanation for the type they recommend.

Thirty-six (36) strands of fiber in the primary loop will be dedicated to electrical system monitoring and control operations (SCADA/DCIS), and the remaining sixty (60) strands will be dedicated to general data communications between the SEU and other City entities.

2.6 Special considerations:

The initial generating capacity of the SEU's new PGS puts the utility just below the current requirements for NERC, FERC, and CIP compliance; however, potential increases in generating capacity in the future will put them squarely within those requirements. Therefore, this fiber optic communications network must be designed with these requirements in mind. Proposals submitted shall demonstrate the respondent's knowledge and expertise with regards to these regulations and the design of secure and reliable communications for critical infrastructure.

2.7 System Documentation & Fiber System Management Solutions:

Detailed installation records must be kept during the construction process and provided to the SEU as system documentation to assist the utility with maintenance, troubleshooting, and future system expansion. At a minimum, the documentation shall identify each cable segment and splice case, provide route/ground distance of each segment, cable length of each segment including all slack and storage with accumulating totals, latitude and longitude coordinates for all splice cases and storage loops, and detailed splice and termination plans. The documentation shall also include a detailed diagram and explanation of the data communications network and its final configuration. Respondents are welcome to provide optional pricing for more advanced, interactive and dynamic fiber management solutions.

2.8 System Testing and Performance Requirements:

Each strand of fiber must be tested after installation and documentation provided to certify that it meets accepted industry performance standards for dB loss and to verify that the strands are properly spliced according to approved splice plans. Tests shall be performed through splice cases and patch panels, where applicable and cumulative loss data provided. Respondents shall provide a detailed description of their testing methodologies and system documentation processes.

2.8.1 SCADA System Integration and Coordination:

The successful respondent will be required to coordinate with the SEU and the SEU's SCADA system vendor to troubleshoot any splicing, termination or fiber performance issues during the implementation and testing of new SCADA communications equipment, which shall occur concurrently with the fiber optic network construction. Some pre-planning will be required to ensure the design provides adequate connectivity for the SCADA system and to coordinate construction and SCADA upgrade schedules.

2.9 Spare Equipment and Materials:

Two (2) spare units of each type of telecommunications equipment shall be provided to expedite critical repairs. Additional materials, such as splice cases, storage racks, patch panels, fiber jumpers, and pole attachment hardware may be requested to be provided.

2.10 Project Timeline:

The project will begin after vendor selection and successful contract negotiations. All work is expected to be completed within one (1) year from the date the contract is executed. However, it is critical that connectivity is established between the City Data Center and the New PGS on or before April 1, 2016. As noted in section 2.8.1, some pre-planning will be required to coordinate construction and SCADA system upgrades.

3.0 Selection Criteria:

Proposals will be evaluated on the following criteria with no particular weight or emphasis on any given criteria.

- Ability to meet or exceed project requirements
- Ability to obtain materials and labor
- Ability to complete the project within or earlier than the project timelines
- Industry knowledge and experience
- Knowledge and implementation of NERC, FERC, and CIP requirements
- Customer references and industry reputation
- Cost and quality of proposed solution

4.0 Response Deliverables:

The proposal shall include:

- Initial design & overview of design processes and future project deliverables
- Biographical information for company and project personnel
- Statement of NERC, FERC, and CIP qualifications and experience
- Examples of recent (within the last 5 years) fiber optic projects with emphasis on those for utilities and with NERC/FERC/CIP requirements
- Customer references and contact information
- Description of project and product warranties
- Description of fiber testing and system documentation methodology
- Product specification sheets for recommended products
- Itemized Pricing Summary with subtotals for equipment and materials (products), design and engineering labor, and installation labor.

5.0 Future Deliverables:

The successful respondent will be required to submit final design and construction plans to the SEU for approval prior to start of construction.

6.0 RFP Timeline/Instructions:

- RFP Published - August 24, 2015
- **Mandatory** Pre-Proposal Conference
  Tuesday, September 8, 2015 at 2:00 P.M.
  Municipal Building, Room 2073
  723 S Lewis St
  Stillwater, OK 74074
  In-person attendance of the pre-proposal conference is required and will represent the attendee's intent to respond. Proposals will only be accepted from those who had representatives attend the pre-proposal conference.
- Proposals Due – Two (2) sealed copies of the proposal which includes One (1) digital copy (.pdf format) must be submitted to the Stillwater City Clerk before 5:00 P.M., Monday, September 28, 2015.

  Stillwater City Clerk
  Municipal Building
  723 S Lewis St
  Stillwater, OK 74074

  The outside of the sealed proposals must be clearly marked with the RFP number and name (RFP#: 2015-919 Fiber Optic Network).
- Anticipated Award Date – Monday, October 12, 2015

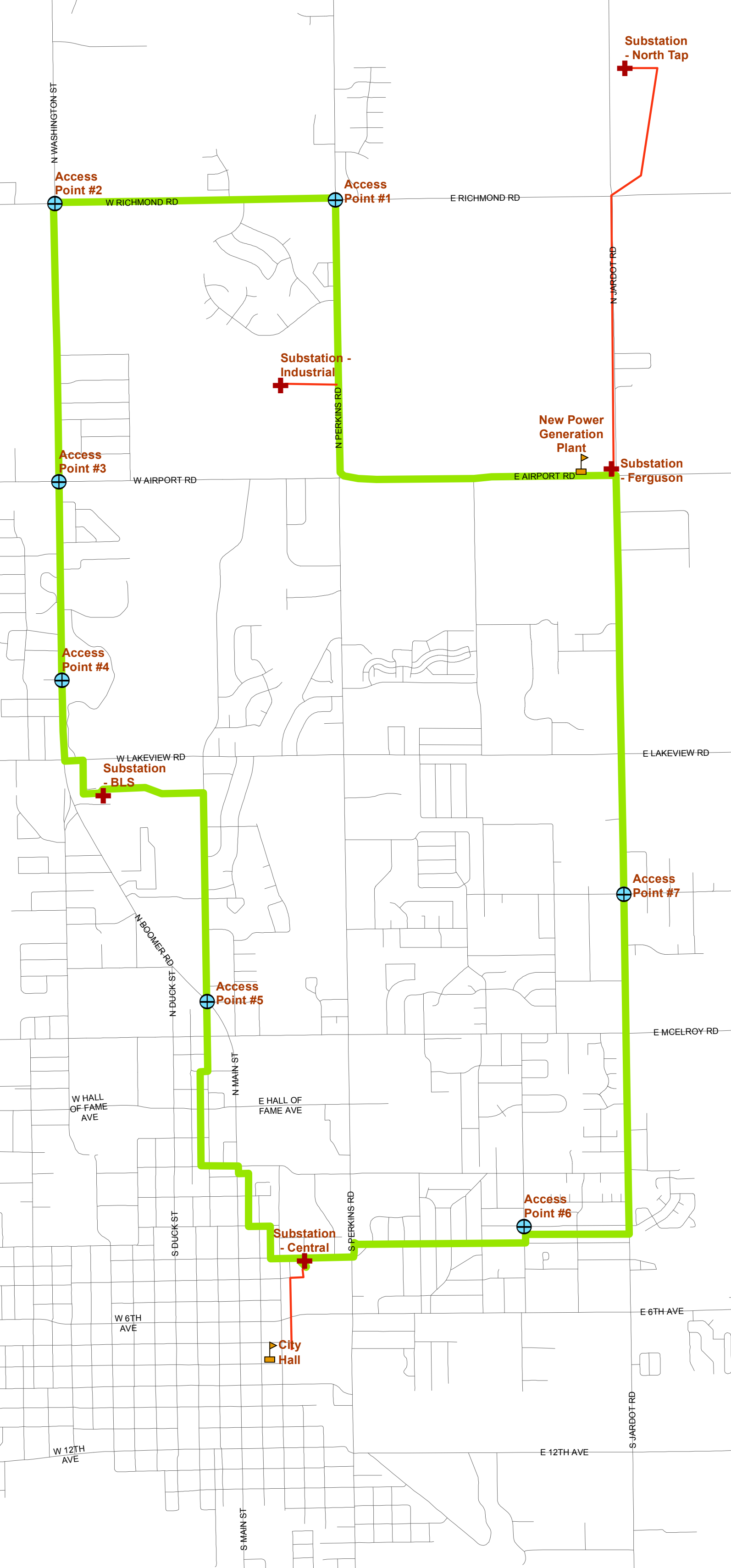
7.0 Bonding, Insurance, & Contract Jurisdiction:

The successful bidder shall file a performance bond, statutory bond and certificates of insurance in the statutory amounts for public liability and workers compensation insurance at the time of signing the contract.

Any agreement entered into as a result of this request for proposals shall be construed under the laws of the State of Oklahoma, and the venue for enforcement of the agreement shall be the State of Oklahoma.

8.0 Reservation of Rights:

Nothing contained in this RFP shall be construed to require or obligate SUA to select any proposals or limit the ability of SEU to reject all proposals in its sole and exclusive discretion. SUA further reserves the right to withdraw and terminate this RFP at any time prior to the proposal deadline or execution of a contract.


Substation
- North Tap
N WASHINGTON ST
Access
Point #2
W RICHMOND RD
Access
Point #1
E RICHMOND RD
N JARDOT RD
Substation -
Industrial
N PERKINS RD
New Power
Generation
Plant
Access
Point #3
W AIRPORT RD
E AIRPORT RD
Substation
- Ferguson
Access
Point #4
W LAKEVIEW RD
E LAKEVIEW RD
Substation
- BLS
Access
Point #7
N BOOMER RD
N DUCK ST
Access
Point #5
E MCELROY RD
N MAIN ST
W HALL
OF FAME
AVE
E HALL OF
FAME AVE
Access
Point #6
S PERKINS RD
Substation
- Central
S DUCK ST
W 6TH
AVE
E 6TH AVE
City
Hall
S JARDOT RD
W 12TH
AVE
E 12TH AVE
S MAIN ST