

CITY OF COLUMBUS / DEPARTMENT OF TECHNOLOGY
FIBER MAINTENANCE AND RESTORATION SERVICES
SPECIFICATIONS

1.0 SCOPE and CLASSIFICATION

- 1.1 **Scope:** This Invitation to Bid (ITB) is to provide the City of Columbus, Department of Technology (DoT) with routine cable maintenance, fiber restoration and cable locate services, to include labor, parts, materials and supplies, for the City of Columbus fiber optic network as defined in exhibit #1a. The City of Columbus/DoT owns approximately 500 miles of fiber optic cabling in various strand count quantities throughout the City. Offerors must be able to initiate emergency fiber optic restoration services within a 2 hour window on a 24 x 7 x 365 basis. The City utilizes GIS and Auto CAD for fiber optic as-built documentation with the intent to migrate fully the outside plant portion to the City's GIS platform.

Routine maintenance will encompass approximately 225 miles of aerial fiber (exhibit #1a) and another 100 miles of coaxial / twisted pair outside plant wiring as defined in exhibit #1b

Cable locate service ticket volume is estimated at 12,000 tickets annually with 2,400 actual locates performed.

- 1.2 **Classification:** Offerors must meet the following requirements to provide the City with fiber restoration services as detailed herein.
- 1.2.1 **Bidder experience:** Offerors must have at least five (5) years of experience providing routine maintenance; fiber restoration and cable locate services.
- 1.2.2 **Bidder References:** Offerors must be able to provide at least three (3) references from existing customers, equivalent to the size of the City's current fiber optic network or larger.
- 1.2.3 **Specification Questions:** In order to enable accurate communication in respect to this ITB, and to provide offerors the opportunity to seek clarification on any matters pertaining to the ITB requirements, and to enhance the offerors understanding of the City's needs, questions regarding this bid must be sent by in writing via email to vendorservices@columbus.gov no later than 8:00 a.m. (local time) on 02/23/2017. Responses will be posted as an addendum to this bid on the City's website (vendorservices.columbus.gov) no later than 5:00 p.m. (local time) on 02/27/2017. E-mails containing the written questions should include the Solicitation number and Title in the subject line.
- 1.2.4 **Single Award:** Due to the nature of this contract, The City will only accept bids for all products and services as a whole.
- 1.2.5 **No Substitutions:** All bids shall be based upon the Standards specified and not on any proposed substitutions. A bidder desiring to make substitutions for brands specified shall list such proposed substitutions on a separate sheet clearly identified as an Alternate Proposal of Materials; together with the amount to be added to, or to be deleted from the amounts of its Base Bid. Only materials, parts and supplies that meet or exceed the item as bid as determined by the Engineer will be considered. No

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substitutions will be considered without submission of complete and appropriate documentation (i.e. manufacturer's cut sheets) that adequately show how the substitution meets or exceeds all of the specifications of the requested item.
Substitutions will not be considered in determining lowest responsive bid.

- 1.2.6 **Required Permits:** This is a maintenance and repair specification and the facilities under consideration are pre-existing, the City will be assumed to have previously obtained any AT&T, AEP and MELP permits and any other private permissions required to access their facilities. The Contractor is responsible for obtaining all other required permits.

2.0 APPLICABLE PUBLICATIONS

- 2.1 U.S. Department of Agriculture, Rural Electrification Administration Specification for Totally Filled Optical Fiber Cable, PE-90
- 2.2 EIA/TIA 455-A, Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and other Fiber Optic Components
- 2.3 EIA/TIA-455-25A, Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies
- 2.4 EIA-455 28B, Method for Measuring Dynamic Tensile Strength of Optical Fibers
- 2.5 EIA-455-33A, Fiber Optic Cable Tensile Loading and Bending Test
- 2.6 EIA-455 34, Interconnection Device Insertion Loss Test
- 2.7 EIA-455-41, Compressive Loading Resistance of Fiber Optic Cables
- 2.8 EIA/TIA-455-81A, Compound Flow (Drip) Test for Filled Fiber Optic Cable
- 2.9 EIA/TIA-455-82B, Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable
- 2.10 EIA 455 89A, Fiber Optic Cable Jacket Elongation and Tensile Strength
- 2.11 EIA-455 95, Absolute Optical Power Test for Optical Fibers and Cables
- 2.12 EIA-455-104, Fiber Optic Cable Cyclic Flexing Test
- 2.13 EIA/TIA-598, Color Coding of Fiber Optic Cables
- 2.14 EIA/ANSI-472 Generic Requirement for Optical Fiber and Optical Fiber Cables
- 2.15 ANSI/ICEA S-87-640
- 2.16 ANSI/TIA/EIA-526-7: OFSTP-7 Measurement of Optical Power Loss of Installed Single-mode Fiber Cable Plant.

3.0 REQUIREMENTS

3.1 **General Requirements:**

- 3.1.1 **Term:** The proposed contract shall be in effect for three (3) years from the date

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of a purchase order certified by the City Auditor.

- 3.1.1.1 **Annual Extension:** Subject to mutual agreement, the period covered by the ensuing contract, under the same terms and conditions stated therein can be extended for two (2) additional one year terms, or portion thereof, at the same pricing and escalator clause.
- 3.1.2 **Pricing:** The bidder shall submit firm, fixed rates for the items listed on pages 5A-5C. Prices shall be all-inclusive, incorporating travel-related costs, overhead, general and administrative costs, and profits.
- 3.1.2.1 **Escalator Clause:** No price adjustment shall be granted during the first year (12 months) duration of an awarded contract. Thereafter, any price adjustment will be negotiated as part of exercising an annual extension, per section 3.1.1.1. Such price adjustments will be firm and fixed for the duration of any annual extension.
- 3.1.2.2 **Right of Cancellation:** Prior to any annual extension, if supplier's total request(s) for a price increase(s) are greater than fifteen percent (15%), the City of Columbus may cancel this agreement by not exercising the next available annual extension.
- 3.1.3 **Quantity Estimates:** The types and estimated quantities of each item are listed on pages 5A-5C. The amounts shown are estimates of the annual needs of the City under this contract and are for bidding purposes only. This estimate is not to be construed as representing an actual order for that amount, or a guarantee that any minimum amount will actually be purchased. The City estimates spending up to \$200,000 per year through this agreement. The City reserves the right to purchase up to twice the estimated quantity.
- 3.2 **Bidder Requirements:** The requirements of this section will be used by the City to determine if each bidder meets the minimum standard required to be considered a responsible bidder. Please complete pages 5D and 5E and attach any supplemental pages as may be necessary to meet these requirements.
- 3.2.1 **Experience Required:** Offeror shall document and submit with the bid their ability to provide routine maintenance; fiber restoration and cable locate services. Documentation must demonstrate at least five (5) year's experience providing installation, maintenance, and restoration services to fiber optic networks equivalent in size to the City's fiber optic network or larger.
- 3.2.2 **References (pages 5D & 5E):** The offeror shall provide documentation of long-term relationships with customers that are equivalent to the size of the City's current fiber optic network or larger. Offeror shall furnish the City with a list that outlines the number and types of similar contracts within Columbus, Ohio and the state of Ohio. Supply at

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least three (3) references from companies that the offeror supports that are similar in scope, complexity, and cost. Onsite visits may be scheduled with those organizations.

- 3.2.2.1 **Contact Information Required:** The reference contact information shall include the customer name, point of contact name, start/end dates of the contract, customer e-mail address, street address, telephone number, and fax number.
- 3.2.3 **Four (4) Hour Service Initiation:** To facilitate prompt response and resolution of emergency fiber restoration incidents, Offeror must guarantee that any of the items listed on pages 5A-5C can be deployed to a work site within four (4) hours of emergency service notification from the City.
- 3.2.3.1 **Minimum Required Inventory:** To facilitate prompt response to emergency repairs, Offeror must have available in inventory at least five-thousand (5,000) feet of single mode fiber each for strand counts of 12, 24, 48, 96, 144, 192, and 288. In addition, available inventory must include at least four (4) fiber optic splice enclosures, seventy-two (72) 36 count splice trays, and two-thousand (2,000) fusion splice sleeves.
- 3.2.3.2 **Advance Arrangements for Equipment:** The Contractor will have advance arrangements in place with construction Contractors who will provide, if needed, heavy construction equipment such as backhoes, trenchers, boring equipment, etc. as necessary.
- 3.3 **Personnel:** The Bidder must submit supplemental pages containing resumes of the primary staff that would be delivering service to the City. The information shall include current position with the offeror, verifiable technical training, education and experience level on the specific fiber restoration service(s) they will be expected to perform. Offeror will also be expected to supply the same documentation for any additional technician(s) assigned to the City's account during the terms of the contract (i.e., new hires, staff transfers to City account, subcontractors, etc.).
- 3.3.1 **Local Staffing:** The Contractor will provide qualified employees and supervisors locally based in the Service Area (see exhibit #1a and 1b). Upon award of contract the Contractor shall provide City with a list containing Support Center addresses, name and work telephone numbers of supervisory management employees responsible for service delivery. Contractor will maintain the call list and will notify the City immediately of any changes in address or personnel.
- 3.3.2 **Staff Replacement:** Upon request of the City, the offeror shall withdraw any of the Offeror's employees on assignment to the City who is, in the City's reasonable opinion, unsatisfactory for servicing the City's needs under this agreement. In all such cases, the offeror agrees to assign a replacement employee who is acceptable to the City.
- 3.3.3 **Experience Documentation:** Prior to assignment for servicing the City, EVERY installer working on any job MUST supply a photocopy of their certificate of completion

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from an accredited fiber optic installation school along with their hands-on work experience splicing fiber optic cable. All installers will be approved by the City prior to being allowed to begin work.

- 3.3.4 **Current Licenses and Certifications:** All Contractor employees including subcontractors hired by the Contractor and supervisors working on this contract will maintain any and all current licenses and certifications that may be necessary for the work that person will be performing. Failure to do so will result in the employee being removed from the job until such time as the Contractor provides evidence that the employee has restored their credentials and work previously performed by that employee will be required to be re-done at the Contractor's expense.
- 3.3.5 **Ohio Department of Transportation Minimum Skills:** Because the Contractor may be working on segments of the City system that interfaces with the State of Ohio's fiber optics system, bidders shall provide proof of meeting ODOT's Minimum Skills Requirements for Work Type 56: Fiber Optic Cable Installation, Splicing, Termination and Testing – Intelligent Transportation System. This work type includes the installation, splicing, termination and performance testing of single mode and multimode fiber optic cable and related equipment necessary for the transmission of video, voice, or data for outside plant applications. This work type includes all Traffic Signal System fiber optic work and work associated with Intelligent Transportation Systems projects.
- 3.3.5.1 **Work Type 55:** Whereas ODOT Work Type 56 is inclusive of Work Type 55, Contractor must also provide proof of meeting the minimum requirements of ODOT Work Type 55: Fiber Optic Cable Installation, Splicing, Termination and Testing – Traffic Signal System. This work type includes the installation, splicing, termination and performance testing of single mode and multimode fiber optic cable and related equipment necessary for the transmission of video, voice or data for outside plant applications. This work type includes fiber optic work associated with traffic signal projects. In addition to the general skills requirement and the minimum skill requirements for Work Type 55, the Contractor must demonstrate successful experience in performing each of the following:
- 3.3.5.1.1 a minimum of one thousand (1,000) splices of single mode and/or multimode fiber;
- 3.3.5.1.2 a minimum of two hundred (200) terminations of single mode and/or multimode fiber;
- 3.3.5.1.3 a minimum of five (5) miles in length of installation of outside plant fiber optic cable including at least one (1) contiguous segment at least one (1) mile in length.
- 3.3.5.2 **SFOT:** The Contractor must furnish a Supervising Fiber Optic Technician (SFOT) who has successfully completed a comprehensive training course for inside or

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outside plant installation, splicing, termination, and performance testing of single mode and multimode fiber optic cable.

- 3.3.5.2.1 The course must be a minimum of 32 hours total of instruction of which a minimum of 16 hours must be hands-on instruction. The Contractor must demonstrate that the course curriculum included, at a minimum, the following topics: fiber optic theory and principles; fiber types; cable types; panels and enclosures; design; safety; inside and outside plant installation; cable preparation; connectors and connectorization; splicing and terminations; OTDR and test equipment theory, setup, measurement, and documentation; restoration and repair.
- 3.3.5.2.2 The SFOT must have a minimum of one (1) year of work experience in the installation, splicing, and termination of fiber optic cable and in the testing of fiber optic cable using an optical time domain reflectometer (OTDR) and a power meter as primary job responsibilities.
- 3.3.5.3 **Installers:** The Contractor's installers performing any type of fiber optic work shall have successfully completed a minimum 16 hours total of instruction of which a minimum of 8 hours must be hands-on instruction.
- 3.3.5.3.1 The Contractor must demonstrate that the course curriculum included, at a minimum, the following topics: fiber optic theory and principles, fiber types, cable types, safety, cable preparation, connectors and connectorization, splicing and terminations, ODTR operation, restoration and repair.
- 3.3.5.3.2 Detailed course curricula showing topics, total hours of instruction and hours of hands-on instruction along with a copy of a certificate of completion of the courses must be submitted for evaluation purposes.
- 3.3.6 **Subcontractor Identification:** The bidder is required to provide a workforce with the experience and training required to provide timely and effective fiber restoration services. Where the employees are not employed directly by the bidder but are being provided by subcontractors in order to provide any of the necessary experience to perform work, those subcontractors must be identified on page 5F.
- 3.3.6.1 **Information Required:** If subcontractor(s) are to be used, please list (as part of the response) names, addresses, telephone numbers and a contact person for each subcontractor. All subcontracts must have valid contract compliance certification.
- 3.3.6.2 **Subcontractor Contact:** Should the offeror use subcontractors, the City shall use the offeror as the primary contact point.
- 3.4 **Labor Requirements:** The offeror shall provide routine maintenance and emergency restoration services in support of the City's fiber optic network in strict accordance with industry

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accepted practices. It is understood that the Contractor shall provide all the necessary hardware, conduit, cable, and other ancillary items necessary to deliver the maintenance and repair services described below. All maintenance and repair work shall be done in a thorough and workmanlike manner; in accordance with these specifications; in compliance with all applicable local, state and national codes and legal requirements; and shall be subject to acceptance by the City. The Contractor's services will be available twenty-four (24) hours a day, seven (7) day a week, fifty-two (52) weeks/year.

3.4.1 Routine Maintenance

- 3.4.1.1 Quarterly Drive-Off:** The Contractor shall in the general course of the performance of their maintenance duties under the terms of this contract drive the entire plant at least once a quarter (4 times per year). This drive-off may be done once a quarter or the plant can be segmented into pre-defined monthly sections. A proposed schedule of the expected drive-offs and example report shall be provided to the City as a part of this bid.
- 3.4.1.1.1** A report of the drive-off shall be provided to the Contract Manager with a copy going to the Engineer at end of each calendar quarter or if segmented into monthly sections, by Monday morning following the end of the month the section was performed.
- 3.4.1.1.2** This report shall contain the date the area or section was inspected, the area or section that was inspected, all observed problems contained within the area or section listed by each of their specific locations and any identification associated with the problem location, and any recommended corrections for the observed problems and the identity of the individual making the observation.
- 3.4.1.1.3** Any problems noticed by the Contractor during the term of this contract that would require immediate correction for health, safety, security or plant performance reasons will be reported by a phone call to the Contract Manager immediately upon discovery with an immediate follow-up in writing. Failure to do so will make the Contractor responsible to and legally liable for all legal and financial responsibilities resulting from the identified problem.
- 3.4.1.2 Maintenance Work Orders:** The Contractor will provide the City with an E-Mail address or web site for the City to use to deliver maintenance job requests to the Contractor. The delivery point must be of sufficient size and have adequate capacity to enable the City to provide the Contractor with drawings, photos, spreadsheets and other ancillary documents that the City would deem appropriate for the conveyance of the work description to be fully understood by the Contractor. Upon receipt of such the Contractor will assign the work with a unique number for tracking purposes and return that number back to the City as acknowledgement of receipt of the work order.

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- 3.4.1.3 **Preplanned Maintenance:** All preplanned maintenance shall be discussed with the Engineer prior to the starting of any work. All fiber optic cable splice point locations, slack span locations, and fiber-to-fiber / buffer-to-buffer splicing details will be identified and laid out in advance with the Engineer prior to any fiber placement or splicing. Failure to do so will result in the Contractor being required to redo the work to the Engineer's specifications at the Contractor's expense.
- 3.4.1.3.1 No milestone charts (e.g., Gantt chart or timeline bar chart) will be required as a part of preplanned maintenance services. However if any repair or installation is expected to span a time period of more than ninety (90) days, a projected timeline chart will be required for that preplanned maintenance project and weekly updates will be provided to the City by the Contractor.
- 3.4.1.4 **Worksite Contact:** Upon the initiation of each job the Contractor will provide a single point of contact for each work site.
- 3.4.2 **Emergency Restoration Services**
- 3.4.2.1 **Single Point of Contact/Escalation:** The Contractor will provide a single point of contact to initiate emergency restoration service and an escalation list should assistance be needed. Requests for emergency restoration service will be documented through the system described in section 3.4.1.2.
- 3.4.2.2 **Response to Emergency Notification Call:** The Contractor will return notification call within 15 minutes of City notification. Escalation procedures will be initiated after the initial 15 minute time period has elapsed.
- 3.4.2.3 **Response to Repair Calls:** The Contractor will have service technicians respond to an emergency site designated by the City within two (2) hours of notification.
- 3.4.2.4 **Restoration Service:** Restoration service will begin within four (4) hours of initial notification. The Contractor's technicians will continue those services as quickly as possible until temporary emergency services (splice or bridge around) or permeate repairs have been completed and the fiber link connectivity is restored.
- 3.4.2.5 **Status Reports:** The Contractor will provide hourly status reports to the Contract Manager during emergency restoration. These reports shall be provided by voice or email at direction of the Contract Manager and will continue until the job is completed or the Contractor is otherwise directed by the Contract Manager.
- 3.4.2.6 **Notice to Proceed:** The Contractor will not initiate any emergency repairs without being directed to do so by the Contract Manager. Should the Contractor

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notice a condition that they feel constitutes an emergency they shall at once notify the Contract Manager and only proceed as directed.

- 3.4.2.7 **Emergency Test:** The City will have the option to require one test of the emergency repair service annually. The purpose of this test is to ensure that all personnel and material required for the service are able to respond should a real emergency occur.
- 3.4.3 **Cable locate services**
- Requests:** Contractor will receive utility locating requests from the Ohio Utilities Protection Service (OUPS) on behalf of the City. The City currently receives approximately 1000 requests a month (12,000 annually) with approximately 200 a month (2,400 annually) requiring locate service.
- 3.4.3.1 Contractor shall perform utility locating services at necessary locations within 48 hours of receipt of locating notice.
- 3.4.4 **General Labor**
- 3.4.4.1 **Access to Work Sites:** Contractor will in no way restrict or impede the City from observing their operations during the performance of their work. Surprise inspections by the City are to be expected. Contractor may reserve the right for health or safety reasons to prevent the City from temporally entering a work site if the Contractor feels that such entry would put the Contractor, the City or the end users at risk from a health or safety standpoint. Contractor shall immediately work with the City on-site to mitigate the risk so that the City inspection can occur.
- 3.4.4.2 **Right to Stop Work:** The City reserves the right to stop work at any job site and require the removal of any personnel or equipment that it believes to be functioning or being operated in an unsafe manner. The City additionally reserves the right to stop work at any job site and require the addition of personnel or equipment that it believes are missing and are required for the work to be performed in a safe manner. Work shall remain stopped until such time as the City's on-site representative believes the work can resume safely. Time lost due to this work stoppage will not be billed against the City.
- 3.4.4.3 **Access to City Facilities:** The City of Columbus will provide access to any buildings owned by the city as needed for this contract.
- 3.4.4.4 **Coordination:** Coordination required between any City agencies or private agencies to deliver services will be the Contractor's responsibility. The city will provide any contact information they might have to facilitate this coordination. The Contractor will be required to coordinate all maintenance work with utility

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pole, manhole and conduit owners prior to any work performed as per the owner's requirements. All costs associated with coordination, inspection, supervision and entry into these facilities will be the Contractor's responsibility to pay up-front and will only be billed back to the City if Contractor has included these costs as a separate line item in the Contractors job quote.

- 3.4.4.5 **Restoration:** If it is necessary to remove decorative or retaining walls, exterior walks, paving or lawns for installation, such areas shall be returned to original condition. The Contractor shall execute excavating and backfilling by methods which will prevent damage to other work and prevent settlement. The Contractor shall refinish entire surface as necessary to provide an even finish. Extreme care should be taken in the removal and replacement of bricks as well as the color match in the replacement concrete.
- 3.4.4.6 **Street Occupancy:** All Contractors working within public right-of-ways shall obtain the proper street occupancy permits and follow all MUTCD and other well-established safety rules and regulations to safeguard the public and their workers. The Contractor understands that access to manholes in the roadway is restricted between the hours of 7-9am and 4-6pm. The Contractor will be required to obtain the necessary street occupancy permits and include traffic control as required to complete work as a part of the contract at no additional cost to the City.
- 3.4.4.7 **Amendments to Work Rules:** Section 105.06 and 105.07, Work Hours, Night Work, Work on Sundays and National Holidays, is amended. Work on Sundays and National Holidays is permitted. Work beyond the period one-half hour after sunset is permitted. The Contractor is advised, however, that all work during this period must be in accordance with the City's Noise Ordinance unless such requirements have been waived by action of City Council.
- 3.4.4.8 **Material Lengths:** All information pertaining to cable routes will be provided by the City of Columbus. Determining distances and ordering correct material lengths (including slack spans) will be the responsibility of the Contractor. If materials are determined to have been installed short of the required lengths (including slack spans) the Contractor will bear the cost and responsibility to replace the materials to the required specifications defined by this contract at their expense.
- 3.4.4.9 **Obstructions:** It will be the responsibility of the Contractor to advise the City immediately when discovered if any conduits or cable paths are discovered that will require obstruction removal. If this information is not forwarded to the city in writing within three (3) business days of discovery, the Contractor will assume the full responsibility of clearing such obstructions.
- 3.4.4.10 **Utilities Location:** It is the Contractor's responsibility to verify the accuracy of all utility, sewer or other underground lines or obstructions with the Ohio Utility

PLEASE NOTE:

PLEASE NOTE THAT THE ORIGINAL CITY OF COLUMBUS/DEPARTMENT OF TECHNOLOGY FIBER MAINTENANCE AND RESTORATION SERVICES SPECIFICATIONS DOCUMENT WAS 104 PAGES.

THE ATTACHED REPRESENTS ONLY THE FIRST TEN (10) PAGES OF THE DOCUMENT.