



# City of Flagstaff

**Date:** 7/20/2020  
**To:** Whom it may concern  
**From:** City of Flagstaff  
**Re:** Flagstaff USGS Fiber Project Cost Proposal

The City of Flagstaff is responding to a Request for Proposal for the Flagstaff USGS per Lease LAZ00170.

The City of Flagstaff accepts your proposal. By accepting this proposal, we will need to enter into a contract for services and/or a reimbursable agreement. Please let us know who to work with regarding this agreement. In addition, this will require council approval since the amount exceeds our procurement threshold.

Per the proposal terms we will contract out the Scope of Work per our procurement rules and provide Project Management oversight on the job.

The costs breakdown is as follows:

- Cost of Fiber subcontractor (see attached quote) - \$238,676.84
- City of Flagstaff Admin Fee (14%) - \$33,414\*

\*Admin fee waved as “in-kind” contribution from the City of Flagstaff as the conduit is installed on City owned property. This additional conduit space may be utilized for additional services in the future by the City or other community partner.

**Grand Total = \$238,676.84**

Thank you,

Greg Clifton  
City Manager

The primary points of contacts for this project will be the following:

CJ Perry – IT Director  
928-213-2821  
[cperry@flagstaffaz.gov](mailto:cperry@flagstaffaz.gov)

**Secondary Contacts:**

Craig Smith – Facilities Manager  
928-213-2160  
[craig.smith@flagstaffaz.gov](mailto:craig.smith@flagstaffaz.gov)

Stacey Brechler-Knaggs, Grant/Contracts Mgr.  
(928) 213-2227  
[sknaggs@flagstaffaz.gov](mailto:sknaggs@flagstaffaz.gov)



Date: **July 20, 2020**

Project Name: **U.S. Geological Survey (USGS) OSP Fiber Optic Cabling/Pathways Project**

Solicitation

Number: **Scope of Work & Installation Pricing Proposal**

Proposed for: **U.S. Geological Survey (USGS)  
Flagstaff Science Campus  
2255 N. Gemini Drive  
Flagstaff, Arizona 86001**

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**Aspen's Qualifications:** Aspen provides design/build engineering, construction, and consulting solutions to the Federal, State and Local Government and commercial sector that increases flexibility, efficiency, resiliency, and reliability. We have partnered with large, medium and small firms to maximize the collective expertise to attain these goals. Our senior staff has served well over half a century in the Armed Forces and fully understands team concepts and accomplishing the mission. We offer only the very best in design, engineering, and construction. Our commitment to excellence has rewarded our customers with outstanding solutions for general construction and renovation projects, disaster response/recovery operations, and intricate work at historic sites.

Aspen Communications, LLC, doing business as Aspen Engineering & Contracting, founded in Arizona in 1999, is a licensed, bonded, and insured B-1 General Commercial Contractor (ROC297066), Low Voltage Electrical Contractor, (ROC145414), and Commercial Electrical Contractor (ROC248277), meeting all Arizona licensed contractor qualifications. Aspen offers solutions in design/build of Information Technology, Communications and Security Transport Infrastructure, computer network and IT services, intrusion detection and security systems, programmable logic control systems, specialty power systems, structured cabling and fiber optic installations, and technology consulting.

Aspen is a certified Service Disabled Veteran Owned Small Business (SDVOSB) and SBA 8(a) and HUBZone Company. A Baldrige Quality firm, Aspen adheres to quality as a byword in everything we do.



Aspen holds a GSA IT Schedule 70 Contract #GS-35F-0601W and GSA Security Schedule 84 Contract # GS07F184DA and is on Arizona State Cabling Contract.

## Project Assumptions/Qualifications:

- It is assumed that the USGS will be supplying any information concerning safety issues with regard to any hazardous materials for disclosure to all **ASPEN** employees working on this Project.
- Any additional labor or materials requested by the owner not included in the scope of this response would constitute an adjustment to the scope of work and priced accordingly. All requests for a change order will be in writing and approved by the owner representative with the authority to do so. **ASPEN** will proceed when all parties agree.

## Project Scope of Work

### UNDERGROUND/INTRA-BUILDING PATHWAYS & SPACES

- **ASPEN**, in conjunction with USGS personnel, conducted a Site Survey of the proposed OSP Fiber Optic Cable Pathway for the Flagstaff Science Campus, located at 2250 North Gemini Drive. Based on this Site Survey, the following information was obtained in order to facilitate a new underground pathway that will accommodate (2) new OSP Fiber Optic Cables running between an existing hand hole (7510), and the existing Building Entrance Terminal (BET)/Data Center Telecommunications Room (DCTR) in Building 6, Room 663.
  1. One (1) new underground pathway will be installed running northbound, between the Existing Hand Hole #7510 (EHH-7510) located in the southwest corner area of the intersection at N. Gemini and Cooley Drives, and the north end of the Astrogeology Science Center (Building 6). The new underground pathway will be installed by utilizing both the Horizontal Directional Drill (Bore) and Trench/Backfill methods (refer to Design Drawing 1 of 3 for locations). Total length of this new underground run is approximately 1,200'.
  2. Along the run, two (2) new ADOT#7 type Pull Boxes, and (1) new ADOT#9 type Hand Hole, will be installed between the existing EHH-7510 and Building 6. Two (2) new 4" Schedule-40 PVC Conduits will be placed between EHH-7510 and a newly installed Pull Box #3 (NPB#3). Total length of this new run is approximately 800'.
  3. Two (2) new 4" Schedule-40 PVC Conduits will be placed between NPB#3 and a newly installed NEMA 3R wall-mounted pull box mounted on the outside

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wall of Building 6, Room 652. Total length of this new run is approximately 400'

4. Two (2) 4" EMT Conduits will be installed up and overhead between the newly installed wall-mounted NEMA 3R Pull Box, and the Data Center (DC)/Telecommunications (TR) in Room 663. The EMT conduits will be routed into Building 6, via the interstitial space above the drop ceilings. Total length of this new run is approximately 100'.
5. Each newly installed underground 4" Schedule-40 Conduit and 4" EMT Conduit will contain (2) 4" 3-cell Fabric Innerduct Packs, thereby providing (6) pathways per 4" Conduit, to accommodate fiber optic cables and/or low pair-count copper cables. The Fabric Innerduct provided, will be manufactured by Maxcell Corporation, Wadsworth, Ohio.

## OUTSIDE PLANT (OSP) FIBER OPTIC CABLING SYSTEM

- **ASPEN** will provide and install (1) 24 strand, Singlemode, Armored, OSP Fiber Optic Cable, in (1) of the newly installed 4" conduits between HH7510 and DCTR 663. This new OSP Fiber Optic Cable will be placed in (1) cell of a 3-cell Maxcell Innerduct Pack. An additional 30' of Fiber Optic Cable slack will be left in the DCTR 663 and also inside HH7510 for future splicing by others. Ten feet of Fiber Optic Cable slack will be left in each of the newly installed Pull Boxes and Hand Hole. Total length of run is approximately 1,400'. This newly installed 24 strand Fiber Optic Cable will be dedicated for use by the USGS Data Service Provider. The 24 strand, Singlemode, Armored, OSP Fiber Optic Cable provided, will be manufactured by Corning Cabling Systems.
- **ASPEN** will provide and install (1) 96 strand, Singlemode, Armored, OSP Fiber Optic Cable, in (1) of the newly installed 4" conduits between new NHH#1 and DCTR 663. This new OSP Fiber Optic Cable will be placed in (1) cell of a 3-cell Maxcell Innerduct Pack. An additional 30' of Fiber Optic Cable slack will be left in the DCTR 663 and also inside NHH#1 for future splicing. Ten feet of Fiber Optic Cable slack will be left in each of the newly installed Pull Boxes and Hand Hole. Total length of run is approximately 1,250'. This newly installed 96 strand Fiber Optic Cable will be dedicated for use for the USGS Campus-wide Fiber Optic Network. The 96 strand, Singlemode, Armored, OSP Fiber Optic Cable provided, will be manufactured by Corning Cabling Systems.

## DCTR ROOM 663 BUILDOUT & FIBER TERMINATIONS

- **ASPEN** will provide and install (1) Rack-Mounted 4RU Fiber Optic Closet Connector Housing (CCH), populated with (8) Connector Housing Panels, each pre-loaded with 12 Singlemode Fiber Optic LC type Adapters. All (96) Singlemode Fiber Optic Cable strands will be terminated with Singlemode LC type Fiber Connectors and placed into the Fiber Optic LC type Connector Housing Panel. This CCH will be dedicated for use for the USGS Campus-wide Fiber Optic Network. Closet Connector Housing,

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Singlemode LC Connector Housing Panels and LC Singlemode Connectors installed are manufactured by Corning Cable Systems.

- **ASPEN** will provide and install (1) Rack-Mounted 1RU Fiber Optic Closet Connector Housing (CCH), populated with (2) Connector Housing Panels, each pre-loaded with 12 Singlemode Fiber Optic LC type Adapters. All (24) Singlemode Fiber Optic Cable strands will be terminated with Singlemode LC type Fiber Connectors and placed into the Fiber Optic LC type Connector Housing Panel. This CCH will be dedicated for use for the USGS Data Service Provider. Closet Connector Housing, Singlemode LC Connector Housing Panels and LC Singlemode Connectors installed are manufactured by Corning Cable Systems.
- **ASPEN** will provide and install the required amount of Cable Runways (ladder racks), with associated mounting brackets and hardware to adequately manage the inbound OSP Fiber Optic Cables in DCTR 663. The Cable Runways and associated mounting hardware provided will be manufactured by CPI.

### GROUNDING/BONDING

- **ASPEN** will provide and install grounding conductors (#6AWG) with bonding components within the DCTR Room 663, and bond to the existing Equipment Rack, the (2) new CCH's and the OSP Fiber Optic Cable metallic shields to the existing Telecommunications Main Grounding Busbar (TMGB). Grounding will conform to the ANSI/TIA/EIA-607A Standard in addition to the manufacturer's grounding requirements.

### FIBER OPTIC CABLE TESTING

- **ASPEN** will provide labor and equipment to test all Singlemode, Armored, OSP Fiber Optic Cable strands for both Fiber Optic Cables, post installation. These tests will include end to end attenuation (loss) tests utilizing an Optical Loss Test Set (OLTS) measured at 1310nm and 1550nm. These tests will verify the OSP Fiber Optic Cabling System performance per the requirements as outlined in the ANSI/TIA/EIA-455 and the ANSI/TIA/EIA-567-7 Standards, in addition to the Corning Cabling System recommendations. Documentation depicting the OLTS test results will be provided in both hard copy and electronic formats.

### LABELING

- **ASPEN** will label both of the Fiber Optic Cable ends and each of the Closet Connector Housings/Connector Panels in the DCTR 663. Additionally, both Singlemode, Armored, OSP Fiber Optic Cables will be labeled inside all (4) of the existing and newly installed in-ground Hand Holes, through which they pass. **ASPEN** will develop and implement, in conjunction with the USGS FSC IT Department, a comprehensive labeling scheme that will be both practical and ANSI/TIA/EIA-606A compliant. Documentation for the labeled OSP Fiber Optic Cabling System will be provided in both hard copy and electronic formats.

## PROJECT SPECIFIC EXCLUSIONS

- 120V AC Raceways and Outlets
- Building Grounding Source
- Active Components (ie: Routers, Switches, UPS's, Computers, Etc.)

## Labor Line Items

### 16750 - BUILDING ENTRANCE TERMINAL/DATA CENTER TELECOM ROOM (BET/TR) BUILDOUT

INSTALL FIBER OPTIC CABLE TERMINATION HARDWARE AT BUILDING 6 DATA CENTER (DC)/TELECOMMUNICATIONS ROOM (TR)-663

### 16700 - CABLE PATHWAYS

INSTALL (1) NEMA 3R WALL-MOUNTED PULL BOX ON NORTHWEST OUTSIDE CORNER OF BUILDING 6, ROOM 652

INSTALL (2) 4" EMT CONDUITS (100') FROM WALL-MOUNTED OUTSIDE PULL BOX TO DCTR-663

PLACE (2) 3-CELL MAXCELL INNERDUCT PACKS IN CONDUIT#1 (800') - EXISTING HAND HOLE #7510 (EHH-7510) TO NEW PULL BOX #3 (NPB#3)

PLACE (2) 3-CELL MAXCELL INNERDUCT PACKS IN CONDUIT#2 (800') - EXISTING HH7510 TO NPB#3

PLACE (2) 3-CELL MAXCELL INNERDUCT PACKS IN CONDUIT#1 (400') - NPB#3 TO NEMA 3R AT BUILDING 6 OUTSIDE WALL

PLACE (2) 3-CELL MAXCELL INNERDUCT PACKS IN CONDUIT#2 (400') - NPB#3 TO NEMA 3R AT BUILDING 6 OUTSIDE WALL

PLACE (2) 3-CELL MAXCELL INNERDUCT PACKS IN CONDUIT#1 (100') - NEMA 3R AT BUILDING 6 OUTSIDE WALL TO DCTR-663

PLACE (2) 3-CELL MAXCELL INNERDUCT PACKS IN CONDUIT#2 (100') - NEMA 3R AT BUILDING 6 OUTSIDE WALL TO DCTR-663

### 16720 - OSP FIBER CABLE PLACING

PLACE (1) 24 SINGLEMODE OSP FIBER CABLE (1,400') - EHH-7510 TO BUILDING 6 DCTR-663

PLACE (1) 96 SINGLEMODE OSP FIBER CABLE (1,250') - NEW HAND HOLE #1 (NHH#1) TO BUILDING 6 DCTR-663

### 16740 - TELECOM ROOM TERMINATIONS/SPLICING

TERMINATE (120) SINGLEMODE OSP CABLE FIBERS AT BUILDING 6 DCTR-663

### 16770 - TESTING

OLTS TEST (120) SINGLEMODE OSP FIBER STRANDS

### 16760 - LABELING

LABEL (2) OSP FIBER CABLE ENDS & TERMINATION HARDWARE AT BUILDING 6 DCTR-663

LABEL (2) OSP FIBER CABLES AT (5) HAND HOLES/PULL BOXES

## Materials Line Items

MFG.	PART #	DESCRIPTIONS	QUANTITY
CORNING	096EUC-T4101D20	96 STRAND, SINGLEMODE (OS2), LLT, ARMORED, ALTOS FIBER CABLE	1,300'
CORNING	024EUC-T4101D20	24 STRAND, SINGLEMODE (OS2), LLT, ARMORED, ALTOS FIBER CABLE	1,400'
CORNING	CCH-04U	RACK-MOUNTED, 4RU, CLOSET CONNECTOR HOUSING (CCH)	1
CORNING	CCH-02U	RACK-MOUNTED, 2RU, CLOSET CONNECTOR HOUSING (CCH)	1
CORNING	CCH-CP12-B3	CCH, 12 FIBER APC, SINGLEMODE, LC CONNECTOR HOUSING PANEL	10
CORNING	95-200-99	UNICAM, SINGLEMODE, APC, LC CONNECTOR	120
CORNING	FAN-BT36-12	12 FIBER BUFFER TUBE FAN-OUT KIT, 36" LEGS	10
CORNING	FDC-CABLE-GRND	ARMORED CABLE GROUNDING KIT	4



MAXCELL	MXE86383BL2650	MAXCELL EDGE, 4.00", 3-CELL STANDARD, BLUE WITH 1250# TAPE	5,200'
FIBERPLUS	DVT-S3	BARE FIBER ADAPTER KIT	1
ALLIED	101790	4" EMT CONDUIT	200'
ZORO	RHC242408	NEMA 3R PULL BOX - 24"x24"x8"	1
CPI	10250-712	12"X10' UNIVERSAL CABLE RUNWAY	1
CPI	11421-712	WALL ANGLE SUPPORT KIT, CABLE RUNWAY - 12"	1
CPI	11302-701	JUNCTION-SPLICE KIT	2
CPI	10608-701	VERTICAL WALL BRACKET	2
CPI	40164-001	CABLE RUNWAY GROUNDING KIT	2
CPI	11309-001	FOOT KIT, CABLE RUNWAY	1
ARNCO	BLWP12-1000	1250 lbs. HIGH STRENGTH CONDUIT MEASURING "MULE" TAPE	2
		LOCKJAW PULL BOX SECURITY COVER	2
CONDUMEX	5K-0601-5	#6 AWG, STRANDED, GROUND WIRE - GREEN INSULATION	100'
		CONSUMABLES (VELCRO, MOUNTING HARDWARE, LABELS, ETC.)	1

### OSP FIBER OPTIC CABLING & PATHWAYS INSTALLATION PRICE

Aspen Communications Labor:	\$37,625.92
Aspen Communications Materials:	\$35,265.92
Excavation Subcontractor (Labor & Materials):	<u>\$169,704.00</u>
<b>Total (Installation)</b>	<b>\$242,595.84</b>

#### **USGS Service Provider OSP Cabling Credit**

Labor	\$2,464.00	
Materials	<u>\$1,455.00</u>	
		<b>\$ 3,919.00</b>
<b>GRAND TOTAL</b>		<b>\$238,676.84</b>

**Execution:** All work to be performed by BICSI and/or product-specific certified Installers and Technicians. Project Site Manager will be a BICSI certified Technician with OSHA 30. Project oversight will be provided by a BICSI certified Registered Communications Distribution Designer with Outside Plant certification. Technicians are OSHA Certified.

**Standards and Codes:** Complete structured cabling system will conform to TIA/EIA-568A, TIA/EIA-569B, TIA/EIA-606A, TIA/EIA-607A, TIA/EIA-72, TIA/EIA-67, TIA/EIA-TSB75, TIA/EIA-758 and all applicable State and local codes.

**Warranty:** Manufacturer warranty will apply plus Aspen's standard 1-year workmanship warranty.

**Access:** Owner will provide unhindered access to all work areas during the course of the job. Unwarranted delays, acts of God excluded, will be subject to additional charges.



## 8(a) Certified

— *Don Richardson*

Don Richardson, MBA, RCDD/OSP  
President/CEO  
[d Richardson@aspentelco.com](mailto:d Richardson@aspentelco.com)

Eric Bedell, BICSI Technician  
Vice President/COO  
[ebedell@aspentelco.com](mailto:ebedell@aspentelco.com)

Aspen Communications, LLC DBA Aspen Engineering & Contracting

A SDVOSB, 8(a) and HUBZone Company



**Term:** This budgetary proposal is good for 30 days, based on the date reflected on page 1 of this document.

**Notes:**

Please feel free to contact us if have any questions regarding this proposal. We can be reached at (928) 774-0992.

**ACCEPTANCE**

Proposal Accepted By: \_\_\_\_\_

Date: \_\_\_\_\_ July 29, 2020 \_\_\_\_\_

Printed Name/Title: \_\_\_\_\_ Greg Clifton, City Manager \_\_\_\_\_

Email: \_\_\_\_\_ Greg.Clifton@flagstaffaz.gov \_\_\_\_\_

Phone: \_\_\_\_\_ (928) 213-2053 \_\_\_\_\_