STATEMENT OF WORK

Fiber Optic Network Rebuild

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U.S. Department of Commerce
National Telecommunications and Information Administration
Institute for Telecommunication Sciences

1. Background

The Institute for Telecommunication Sciences (ITS) provides research and development support for the National Telecommunications and Information Administration (NTIA) by performing basic research in radio science that provides the technical foundation for NTIA's policy development and spectrum management activities, as well as solving telecommunications challenges for other Federal agencies, state and local Governments, private corporations and associations, and international organizations. Additionally, ITS addresses emerging telecommunications, information technology, and security challenges and contributes to the creation of telecommunications standards that support the full and fair competitiveness of the U.S. communications and information technology business sectors.
The statement of work for the Federal Advanced Communications Test Site (FACTS) specifically identifies the need for expansion and upgrade of the fiber optic network at Table Mountain as part of the Implementation of Test and Measurement Capabilities objectives.

2. Objectives

ITS requires that the Table Mountain fiber backbone that contains Single Mode Fiber (SMF) and Multi-Mode Fiber (MMF) be replaced from I10C to all building on Table Mountain Communications Test Site.

This objective will be accomplished by running approximately 18 km of an armored, jacketed SMF optic cable comprised of at least 432 fibers, or 216 transmit/receive pairs, and burying it underground next to the roads on Table Mountain, either by directional boring, open trenching, or some combination of the two methods: sharing routes when available to minimize construction costs. The pairs of the fiber optic cable will be divided evenly among locations of the same type, i.e. buildings will receive the most pairs, followed by field pedestals, and entrance gates, which will receive the smallest amount of fiber pairs. The fiber optic portion of the Table Mountain Test Facility Campus Area Network (CAN) will be deployed in a directional ring configuration, starting and ending at Building I-10C, which will also serve as the demarcation point for service spurs for USGS, NOAA, buildings. Additional service spurs will be used to connect the six buildings nearer to the edge of the property as well as the entrance gates. A graphical depiction of the fiber network is shown below in Figure 1.

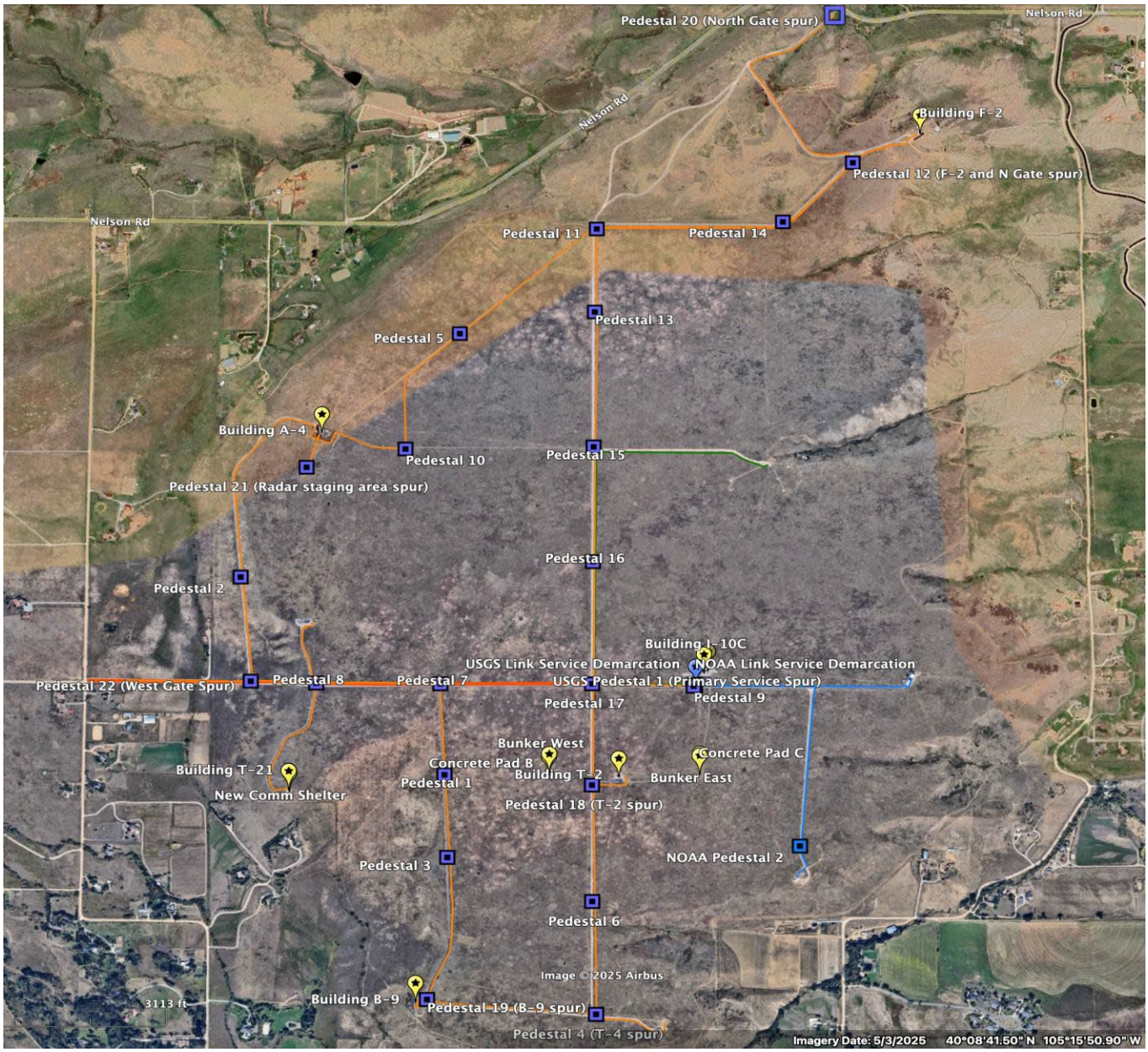

Figure 1-The proposed fiber optic cable locations that comprise the Table Mountain CAN.

The Table Mountain CAN consists of the following sub-networks:

- Primary Service Spur (dark orange) – this is the primary connection to external networks/backhaul service provided by Lumen/CenturyLink and connects the neighborhood distribution cabinet located just west of the West Gate entrance to Point of Presence terminating equipment at I-10C. This sub-network is out of scope for this project.

- NTIA/ITS LAN (light orange) – the optical ring and spurs connecting all ITS-owned buildings.
    - Building T2 is approximately 2,112 feet south of buildingI10C.
        - The fiber comes in on the north side of the building end and contains 6 fibers of SMF and 6 fibers of MMF.
    - Building T4 is approximately 5,808 feet south of buildingI10C.
        - There is no fiber in this building.

- Building B9 is approximately 5,808 feet southwest of buildingI10C.
    - The fiber comes in on the northeast corner of the building and contains 6 fibers of SMF and 6 fibers of MMF.
- Building T1 is approximately 5,280 feet West of buildingI10C.
    - The fiber comes in on the east side of the building and contains 6 fibers of SMF and 6 fibers of MMF.
- Building F2 is approximately 10,560 feet north of buildingI10C.
    - The fiber comes in on the north end of F2 and contains 6 fibers of SMF and 6 fibers of MMF
- Building A4 is approximately 6336 feet northwest of buildingI10C.
    - The fiber comes in on the east side of the building and contains 6 fibers of SMF and 6 fibers of MMF.
- Building T21 is approximately 5,808 feet west of buildingI10C.
    - There is no fiber in this building.
- The west gate is approximately 5808 feet west of buildingI10C.
    - The west gate has no fiber.
- The north gate is approximately 10,560 feet North of buildingI10C.
    - The north gate has no fiber.

A closeup view of the NOAA Link is shown below.

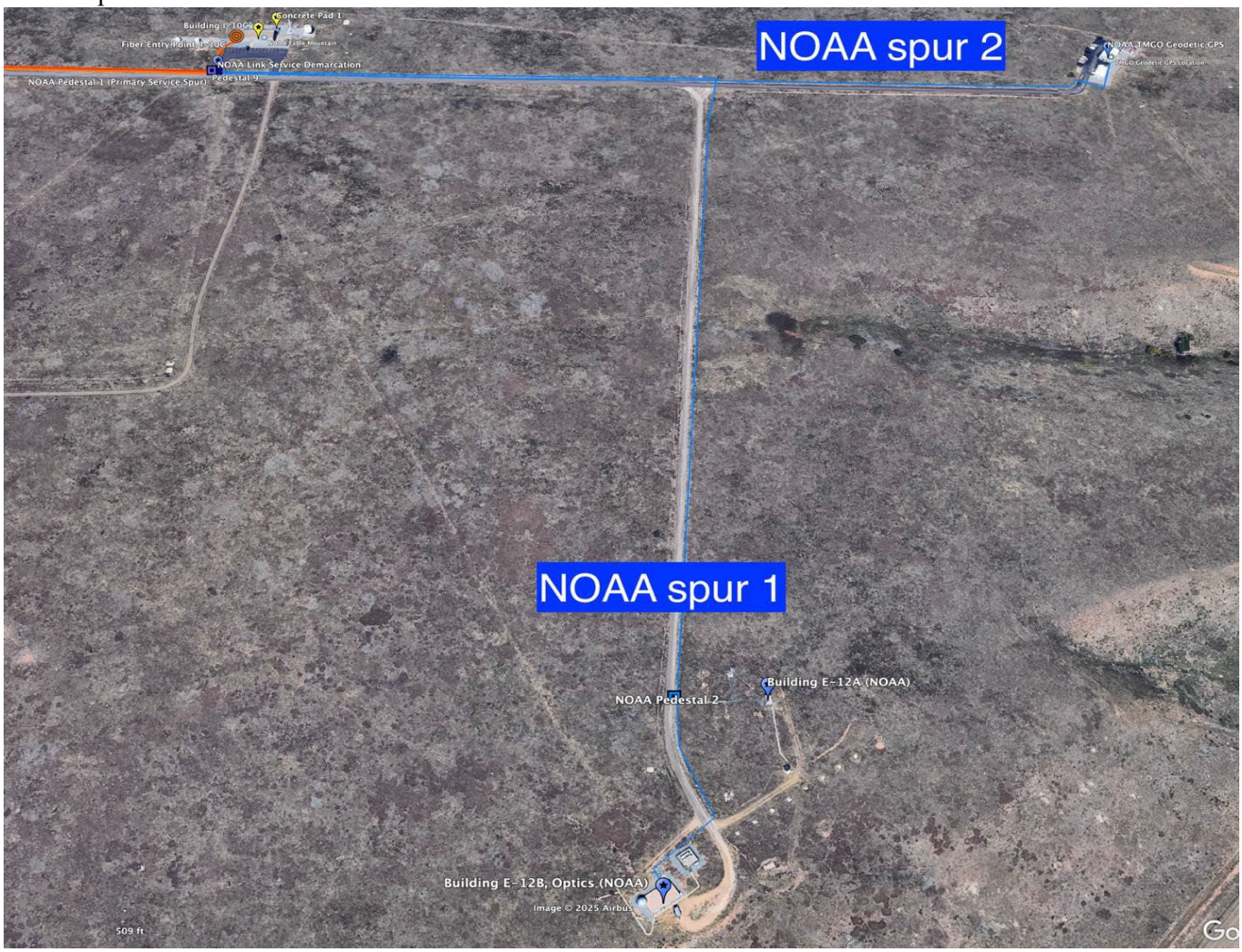

Figure 2-A closeup of the NOAA Link showing the two spurs. NIST will be the primary users of Spur 1, which will be terminated at Building E-12B.

- NOAA Link LAN (blue) – a spur that will serve the buildings used by both NOAA and NIST
    - Building F6 spur 2 is approximately 2,640 feet east of buildingI10C.
        - The fiber comes in on the south end of F6 and contains 6 fibers of SMF and 6 fibers of MMF.
    - E12B spur 1 is approximately 4,224 feet southeast of building I10c.
        - The fiber comes in on the north center of E12B and contains 6 fibers of SMF and 6 fibers of MMF.

A closeup view of the USGS Link is shown below in Figure 3.

Figure 3-A closeup view of the USGS link. Two options were presented to USGS leadership, e.g. follow the road or cut through the field. Ultimately, Option B (follow the road) was chosen as it would be more cost effective to share part of the route with the NTIA/ITS LAN.

- USGS Link LAN (green)- the spur for the USGS facility
    - USGS is approximately 5,280 feet North of building I10c.

- The fiber comes in on the South side of the building and contains 6 fibers of SMF and 6 fibers of MMF.

A closeup view of the proposed demarcation points is shown below in Figure 4.

Figure 4-A proposed placement for the splice point access cabinets which will serve as the demarcation for service to USGS (green) and NOAA/NIST buildings (blue).

The project will consist of five main phases to be completed during FY2026.

3. Requirements

3.1. Scope

- At the conclusion of this project, the Government will receive a fully functional fiber optic network that will allow a user to transmit data at greater than 10 Gbps data rate from any building or field site to any building or field site and provide access to legacy networks at currently available data rates.

3.2. Network Design and Engineering

- Work closely with the ITS Technical Point of Contact (TPOC) to perform the telecommunications network and civil engineering design necessary to meet the stated objective and complete the tasks given below.
- Create a budget with realistic cost estimates for the design of the network, construction, equipment purchases, and equipment installs as a portion of project deliverables.
- Deliver a project plan that covers all phases of the project to be completed in FY26.
- Create construction blueprints to be used during construction and later “as-built” drawings as project deliverables.

3.3. Identify/Procure Equipment

- Work with the TPOC and perform market research to deliver a recommendation for all of the distribution, termination, and networking equipment that will be used during the project, for example.
- Outside plant boxes and cabinets that will be used to access and protect fiber optic cable splices.
- Pedestals for terminating fiber pairs and connecting with weatherproofed fiber jumpers at easily accessible roadside locations near field sites.
- Any applicable industry-standard signage/markers needed to identify buried cable locations, splice points, etc.
- Fiber distribution bays to terminate each building's allocation of fiber pairs in a way that allows the fiber to be interconnected individually.
- Fiber optic transceivers that will allow for termination of each fiber pair in a building with the fastest connection speed that is available and within budget.
  - Ideally, the transceiver will also feature an interface for connecting external information technology and/or networking devices, i.e. the capability to demultiplex light into electrical networking standards commonly found in LAN equipment.
  - Traditional IT equipment used in LANs (e.g. switches, routes, and hubs) may be procured if they are found to be more cost effective than a multi-function optical transceiver.
- Any electrical or fiber optic jumper cables needed to connect transceivers and fiber distribution bays or networking equipment.
- Deliver a comprehensive Bill of Materials (BOM) listing all project equipment, selected vendor, delivery dates, and quoted cost for each item.
- Procure all of the equipment in the BOM as part of the project contract.

4. Construction

- The selected Contractor will either directly perform construction or utilize a subcontractor to handle the following construction/installation tasks.
  - **Fiber Optic Install**
    - Install an industry standard conduit in the ground as specified in the figures given above (via open trench or directional boring) that will accommodate each planned fiber optic cable.
      - 2-inch HDPE conduit & tracer wire. 432ct trunk & lateral fiber, underground vaults pedestals, fiber enclosures, and MSTs.
      - An additional 2-inch HDPE conduit for future expansion will be installed concurrently and in the same bore/trench. Trench needs to be between 18 inches to 24 inches deep.
      - Multiple conduits may share the same bore/trench as a cost saving measure.
    - Remove and dispose of any old fiber optic cables along the route.
    - Identify and inspect any existing cable crossings on the day.
    - Terminate new fiber within buildings and field access sites (e.g., pedestals) using industry-standard demarcation and outside plant access methods.
      - Precision fusion splicing, tier 2 certification (OTDR) and Teir 1 certification (OLTS).
    - Codify fiber installation as a set of industry-standard as-built drawings.
  - **Networking Equipment Install**
    - Install all newly procured equipment and materials in compliance with any/all industry standards and building codes as well as the build plans developed by the contractor.
      - Core Cisco pass through switches 200G/25G optics, and site patching for all buildings.

- Perform industry standard, end to end testing of each newly installed fiber pair to ensure that there are no breaks or faults in the physical media that would adversely affect performance.
- All fibers are terminated at a distribution bay or field pedestal will be clearly marked.
    - Any fiber jumpers used within buildings will be clearly labeled on both ends.
- Perform or oversee test/turn-up of new networking equipment to ensure near faultless operation and interconnection between all sites.
- Advise TPOC on the interface to external networks so that ITD can interconnect new network equipment into existing ITS-ITD network.
- Codify all installed equipment as a set of industry-standard as-built drawings.

- **Networking cabling to workstations**
    - Install all new CAT 6A cable to all workstations in compliance with any/all industry standards and building codes as well as the build plans developed by the contractor.
    - Perform industry standard, end-to-end testing of each newly installed CAT 6A cable to ensure that there are no breaks or faults in the physical media that would adversely affect performance.
    - All CAT 6A cable are terminated at a distribution panel and to a wall mount box with a 4-port 6A data plate will be clearly marked.
    - Perform or oversee test/turn-up of new CAT 6A cable to ensure near faultless operation and interconnection between all data plates and distribution panel.
    - Advise TPOC on the interface to external networks so that ITD can interconnect new network equipment into existing ITS-ITD network.
    - Codify all installed equipment as a set of industry-standard as-built drawings.

5. Project Closeout

- Work closely with COR/TPOC and associated members of ITS staff to deliver a working, tested, and accepted fiber optic network
- Deliver all project documentation to ITS
- Submit final invoices for payment

6. Tasks and Deliverables

The table below lists the major milestones associated with the project phases listed above in the Objectives section.

Table 1-List of project phases and their associated milestones.

Task Number	Work Milestones	Projected Completion Date
1	**Contractor Selection**	**Date**
1.1	Award contract to a contractor	Date
1.2	Attend kick-off meeting	Date
2	**Network Design and Engineering**	
2.1	Schedule a series of technical design meetings with contractor engineering staff and TPOC	
2.2	Deliver a project plan that covers all phases of the project to be completed in FY26	

2.3	Deliver a final design for the outside plant construction	
2.4	Deliver a final design for the IT/networking infrastructure	
2.5	Deliver a final budget with realistic estimates for network design/engineering, construction, equipment purchases, and equipment installs	
2.6	Identify and contract with OSP contractor and equipment installers	
2.7	Create a set of construction and install plan documents, deliver to OSP construction and equipment install teams	
3	**Identify/Procure Equipment**	
3.1	deliver a recommendation for all of the outside plant infrastructure materials during technical meeting	Date
3.2	Deliver a recommendation for all of the fiber termination and distribution equipment during technical meeting	Date
3.3	Deliver a comprehensive Bill of Materials (BOM) listing all project equipment, selected vendor, delivery dates, and quoted cost for each item to TPOC and COR	
3.4	Complete procurement of all BOM items	
3.5	All BOM items delivered	
4	**Construction**	
4.1	Fiber Optic Install	
4.1.1	All conduits placed in the ground	
4.1.2	All fiber optic cables run through buried conduit	
4.1.3	All splice access cabinets and pedestals are installed	
4.1.4	All splices between main ring and spurs are complete	
4.1.5	OSP signage and markers installed	
4.2	Networking Equipment Install	
4.2.1	All fiber terminated at field pedestals	
4.2.2	All fiber terminated at building distribution panels	
4.2.3	All networking equipment installed, powered, interconnected, and tested	
4.2.4	Fiber and equipment labeling complete (distribution panels and jumpers)	

4.2.5	Deliver final results of end-to-end fiber testing, submit plan to resolve any faults or failures	
4.2.6	Demonstrate successful operation of network via end-to-end data transfer	
4.3	Preliminary construction inspection completed, deliver punch list	
4.4	Final inspection completed with no remaining issues	
4.5	Deliver as-built drawings for OSP and networking equipment	
4.6	ITS completes review of as-built drawings	
5	**Project Closeout**	
5.1	All project documentation has been delivered to ITS	
5.2	All construction and install issues have been resolved, final acceptance of build by ITS staff	
5.3	Submit final invoice for payment	
5.4	Final payment received	

7. Government Identified Elements

This section provides information applicable to the contractor that will affect the accuracy of the bid provided, as well as inform on those items the government has identified as pertinent to either the contractor or the government and should be taken into consideration in the execution of the project.

8. Access and Clearances

All personnel authorized to work on the Table Mountain Field Site must be either United States Citizens or maintain a proper H-1B visa. The contractor shall determine which individual(s) will be granted an access code to access the Table Mountain Field Site and building I10c. Up to one person per sub-contractor / trade is authorized. Contractor shall provide a list of people upon contract award. People to be given codes will be required to submit a photocopy of the front and back of their driver's license or copy of their visa. Personnel with a federally issued and current personal identity verification card (PIV), Department of Defense Common Access Card (CAC), or similar may provide that as proof alternatively. The first time each coded person is to access the site, they are required to meet with the contracting officer representative to have their driver's license compared with the copy on record, and to the individual. This contractor's individual will be responsible for coordinating access for personnel. The contractor is ultimately responsible for ensuring all personnel are authorized to work within the United States.

9. Project Timeline

Commencement of work shall be coordinated by the government representative. Activities are expected to begin in earnest within 90 days of award. Total project duration should not exceed 365 days from commencement of work. The subsequent total period of performance shall not exceed 2 years from the contract award. Delays will be considered based on extenuating circumstances such as weather or illness. If the delay is due to supply-chain issues, the contractor will be required to show proof that delays are related to product delivery and there are no delays in contractor ordering.

Contractor shall provide the government representative a general outline of contractors expected schedule and timeline no less than 14 days prior to anticipated work-start.

10. Mitigated Damages

For each day beyond the agreed completion date, which shall be not more than 30 days from Notice to Proceed, contractor agrees to forfeit $500 per day in damages to the government.

11. Delivery

Contractor shall provide submittals for approval within 7 calendar days of the Notice to Proceed (NTP).

The fiber optic network construction will have active work activities taking place during the contractor's work schedule. Construction activities will primarily take place in the locations identified in the Statement of Work. The contractor should make reasonable efforts to minimize disruption to Government operations, as well as protect areas not within the direct work area from dust and noise. Work for each trade shall be scheduled to be completed as efficiently as possible once started, and to minimize impact on operations. Unless coordinated, access to Table Mountain is not authorized on Saturdays, Sundays, or Federal holidays (observed day). Working hours available for installation are typically Monday through Friday, 7:00 AM through 3:30 PM. Work before or after these hours may be accommodated with coordination.

The Contractor shall observe any other day designated by Federal statute, Executive Order or Presidential proclamation. When any such day falls on a Saturday, the preceding Friday is observed; when any such day falls on a Sunday, the following Monday is observed. All personnel assigned to perform under this contract shall limit their observation of holidays to those set forth above.

12. Other Unique Requirements

12.1. Packaging and Marking

- This section defines those elements expected by the government from the contractor upon completion of the work, and before final acceptance and final payment by the government.
  - Contractor shall provide Contracting Officer with all pertinent manuals, licensing, and warranty information, to include all contractor-provided system, software, hardware, firmware and boot or access usernames and passwords for any and all hardware or software installed at the location.
  - Contractors shall provide on-site troubleshooting and repair for a period of 90 days after installation is accepted by the Government, at no additional cost to the government. During this period, the government will accept reasonable costs for on-site visits by the contractor to resolve issues that are later discovered to be the fault of the government. Contractor shall provide phone support at no additional cost for a period of one year after installation is accepted by the Government, or for the length of the standard commercial warranty, whichever is longer.

13. Quality Assurance Plan

Acceptance of installed work/system and complete work is subject to a 100 percent inspection at the site. A full operational inspection by the Government's on-site Project Inspector, demonstrating the work/system is installed according to, and performs as specified in this Statement of Work will be completed prior to acceptance by the Contracting Officer's Representative.

14. Place of Performance

The fiber replacement shall be completed at the following Government location:

NTIA – Table Mountain Field Site
8600 N 39th Street
Longmont, CO 80503

Address is for the facility West gate. North gate access is also available via 51st and Nelson Road.