Pacific Islands Network
DOI Region 12
Information Technology
Team NPS

Scope of Work
Fiber Optic and Network Modernization
Resource Management Building, Facility Management Building, & Bookstore Extension
Pu‘uhonua o Hōnaunau National Historical Park
(PUHO)
84-5559 Keala o Keawe Rd.,
Captain Cook, HI 96704

4/27/2026

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1. General

1.1. The Contractor shall provide all personnel, equipment, supplies (unless noted), materials, supervision, vehicles, and other items and services necessary to furnish and install a new structured fiber optic network cable connection from existing location to a mounted wall rack in the RM building, to the Facilities Management Building next to it. This project is located within Pu‘uhonua o Hōnaunau National Historical Park (PUHO) on the island of Hawai’i.

1.2. The Contractor shall furnish fiber and Cat6 cable, conductors, and devices as described herein, including both inside the project buildings, and external fiber and shielding.

1.3. For purposes of this contract, the Contractor shall replace existing conduit where necessary to shield fiber and any copper cabling from the elements. Contractor shall notify the Pacific Islands Network IT of any additional conduit or connection hardware required.

1.4. All work shall be performed in accordance with system, component, device and/or material manufacturers’ recommendations, and applicable federal, state, and local rules, building codes and regulations, as identified in Attachment A.2 - Reference List of Standards and Codes, unless otherwise specified herein.

1.5. All work shall comply with the National Electric Code (NEC), OSHA, ANSI/TIA/EIA, Hawai’i Building Code and Policy and Requirements.

1.6. Contractor shall furnish proof of current certification to the Pacific Islands Network Manager or their designated representative.

1.7. Pacific Islands Network IT requires that the design and installation of the cabling/fiber optic systems be completed by and under the oversight of a design engineer and comply with current ANSI/TIA/EIA standards.

1.8. Contractor shall coordinate on-site warranty inspection upon completion of project with the Pacific Islands Network IT Manager.

1.9. The Contractor shall cooperate with Pacific Islands Network IT, PUHO employees and Facilities Manager, and adhere to any access constraints implemented by PUHO. The Contractor shall be liable for all damage suffered by PUHO resulting from Contractor's negligence or lack of cooperation.

2. Underground Pathways and Conduit

2.1. An existing conduit between the Resources Management and Facility Management building exists but is in poor condition and houses Category 5 cables. The contractor should replace this conduit and cabling with fiber optic cable in an appropriate hardened conduit (aboveground but easily driven over).

3. Fiber Optic Network Cable

3.1. Furnish, install, label, test and certify multi-mode, armored fiber optic cable, connectors and enclosures.

3.2. For products specified only by reference or performance standards, select any product that meets or exceeds standards subject to PUHO approval. All fiber optics shall be Optical Cable Corporation, Corning, CommScope or equivalent and outdoor rated except patch cable.

3.3. Provide and place all termination devices such as but not limited to fiber distribution panels, bulkheads/couplers and fiber splice modules.

3.4. Except for aerial cable attached to utility poles, all inter-building cable shall be "out-of-sight", in conduit, or placed in existing ducts. All splices shall be housed in maintenance vaults (manholes), handholes or pull boxes, provided by the Contractor and others. The Contractor shall employ modern splicing techniques to ensure against the intrusion and migration of water into the cable by means of the cable splices and other sheath openings. Detectable Tracer Wire\cable markers/locators shall be installed to mark/locate the buried cable path and splice locations.

3.5. Use proper hardware for aerial installations that match cable type, as well as span and tension requirements.

3.6. OSP cable extensions exceeding 50 feet into buildings shall be spliced to indoor rated cable per NEC.

3.7. Fiber-optic connector splicing must be fusion based with two fiber optic strands of the exact make/model on each end using factory terminated pigtails. Epoxy splices shall not be acceptable.

3.8. Fiber-optic OSP field splicing must be fusion based with two fiber optic strands of the exact make/model on each end. Epoxy splices shall not be acceptable.

3.9. Provide minimum 20-foot service loops for all backbone cables at internal building termination locations, and 10-foot service loops in hand hole/vault locations as follows: the first, last, and where direction changes by 90 degrees or more.

3.10. All fiber optic cables shall be protected in innerduct all the way to the point of entry into fiber panels.

3.11. Provide and place horizontal and vertical cable support devices such as but not limited to rack mounted cable management panels, wall mounted cable management devices, cable runway, surface raceway and all required mounting hardware, unless otherwise noted.

3.12. Provide and install approved fire stopping systems in all communication pass-throughs, conduit and cable tray wall and floor penetrations.

3.13. After the fiber optic cable is installed into a duct or innerduct, end plugs shall be installed to provide an effective water seal. The ducts and innerducts shall be kept free of debris and always watertight.

3.14. Develop and provide as-built records and drawings, including single-line diagrams of all cabling, identification labels, grounding, installed patch panels, supporting equipment and other devices supporting the system.

3.15. The OSP multi-mode fiber optic cable system includes the following features:

3.15.1. Provide and install new fiber optic termination enclosures in each of the project buildings.

3.15.2. Contractor shall fully load all fiber optic panels with associated hardware necessary for the termination of multi-mode fiber optic cabling (including adapter panels, fiber management rings, splice trays if necessary and Labeling of cabling).

3.15.3. LC multi-mode connectors shall be used in fiber optic light interface units (LIU). Terminate fiber connectors with factory provided pre-terminated fusion spliced pigtails.

3.15.4. Provide a minimum 18” slack of buffered fiber inside each fiber optic patch panel.

3.15.5. Armored fiber optic cable shall be grounded and bonded to the telecommunications ground bus bar in accordance with the applicable code requirements per ANSI/EIA/TIA 607.

3.16. All exterior fiber must be of interlocking metal armor type, with armored sheath maintained as close as possible to final termination point.

3.17. At all points where fiber transitions fixed surfaces (IE: conduit to wall, wall to adjacent building, etc.) fiber must be installed in such a way that it can break free in the event of heavy seismic activity.

3.18. In locations where stonework prevents building penetration at ground level 4”x4” pressure treated posts and crossbeams must be installed to support the conduit rise and transition to the outside of the building.

3.18.1. All posts and exposed conduit must be painted to match the building. NPS will provide paint color information.

3.18.2. All conduit raised via post must include a pull box or vault at the base of the post.

4. Telecommunication Racks

The telecommunications racks should be wall-mounted and lockable, including cable termination/connection and required cable routing and supporting hardware.

4.1. The Contractor shall furnish conduits into telecommunication wall-mounted racks from the existing fiber termination to the new location and racks in the RM facility (switch is present), FM Facility (need Cisco 9200 Switch) and bookstore facility (switch is present) racks. Category 6 cables from the switches placed in the racks shall be routed in conduit to each work area with a minimum of 2 ports per work area to create a clean office environment (except within the bookstore). Outdoor rated Cat6 cables should be used to

extend the network to the area adjacent to the amphitheater and a wireless access point (provided by NPS) should be mounted there to provide network access to the amphitheater.

4.2. All racks, trays, and hardware shall be grounded and bonded to a telecommunications ground bus bar in accordance with the applicable code requirements per ANSI/EIA/TIA 607. If a bus bar is not present at termination location contractor is responsible for the installation of said equipment. A Universal Power Supply shall also be procured/provided within each rack to provide backup power to switches and wireless Access Points.

4.3. All supporting hardware specified shall be securely wall-mounted in standard 19" telecommunications racks or in standard telecommunications equipment cabinets, furnished and installed by the Contractor. The racks must have swing-out lockable doors with venting mesh and exhaust fan holes. Racks must be no less than 6U in size and accommodate a minimum of 1500 VA UPS to also be provided by the contractor.

5. Fiber Testing

5.1. All fiber optic cable test results shall be submitted to Pacific Islands Network IT as a deliverable report.

5.2. Contractor shall provide manufacturers shipping bill of lading along with factory test results of each reel of fiber or pre-terminated strand used on this project.

5.3. Contractor shall provide a continuity fiber link test on the reels or pre-terminated strands to determine the length of the fiber before installation. This test shall be documented in writing and submitted with test results.

5.4. Contractor shall use a Power Meter and OTDR for fiber testing and provide hard and soft copies of test results including dB loss for links.

5.5. Max loss for a mated pair of connectors shall be less than 0.75dB per ANSI/TIA 568.

5.6. Maximum link loss shall not exceed Fiber Optic Association values posted for Gigabit Ethernet protocol for multi-mode optical fiber cable links. Bi-directional testing shall be done from each end of fiber link and testing shall be performed at dual wavelengths for all tests.

5.7. Contractor shall provide organized test reports with cable IDs and locations clearly indicated. If tests are submitted in such a manner that the cable ID and locations cannot be determined, they shall be returned as non-compliant. All point-to-point fiber tests shall be labeled appropriately from both ends of the link.

6. Major Requirements

Major requirements as described in this subsection shall be priced under the separate contract line items. Contractor shall provide cost and price details for labor, equipment, materials, and all other appropriate

elements of price as related to the major work items described below and provided in the Schedule of Work Items. Locations of cable types, by major segment of the work, shall be summarized in the as built/report.

6.1. Resource Management (RM) to Facilities Management (FM) Building Fiber Optic Cable run.

6.1.1. For all runs, contractor is responsible for:

6.1.1.1. Furnish and install non-buried electrical conduit and 1.25" I.D. innerducts to create or complete the pathway between the RM building and the FM building.

6.1.1.2. Furnish and install 3 ea. 1.25" I.D. innerducts (with unique colors) each with pull tape, in the 4" conduit unless other armored conduit has been communicated and accepted by the IT Manager.

6.1.1.3. Prior to placing cable in existing conduit, Contractor shall verify the structural integrity and clear passage of existing conduit by passing a squeegee and slug. Any use of existing conduit must be confirmed with Pacific Islands Network IT Manager.

6.1.1.4. Furnish, install, label, and test new 12-strand, OSP Inter-building fiber cable between the RM building and FM building. Distribution for converged voice and data services is achieved in buried conduit through use of multi-mode, armored OSP cables and components.

6.1.1.5. Provide and install all LIUs, adapter plates and associated equipment to terminate the 12-strand fiber optic cable in the FM rack and the 12-strand fiber optic cable in the RM building.

6.1.1.6. This project requires minimal changes to existing structural integrity of any building. Any changes other than allowing cable passage/conduit/raceway must be pre-approved by the Pacific Islands Network Manager.

6.2. RM Building

6.2.1. Wall Mounted Switch Rack (see A.4.5) – Mount rack to left of main entry door. The Center of rack should be 48–60 inches (eye level). This shall be the network distribution hub for all wall jacks as well as the fiber hub connecting back to the museum. The rack shall be lockable and only accessible by IT or maintenance facilities (FM) when needed (2 sets of keys produced and given to park administration officer). The rack shall house a universal power supply (see A.4.4) for the switch.

6.2.2. The Contractor shall furnish and install Cat 6 Ethernet cabling that is outdoor-rated, waterproof, and suitable for deployment in high-humidity environments. Cabling shall utilize solid copper conductors, a UV-resistant LLDPE jacket, and shielding sufficient to mitigate environmental interference. Any cable under or outside of buildings shall be protected from rodents using hardened conduit. All materials shall

comply with ANSI/TIA-568 standards and be warranted for performance in coastal or tropical conditions. Interior cables shall use aesthetic cable raceways designed to conceal and protect Ethernet and power cables in occupied spaces. Raceway systems shall be low-profile, paintable, or finished in neutral colors to blend with interior décor, and shall include modular fittings (elbows, tees, end caps) to ensure continuous coverage along walls, baseboards, and ceilings. All raceways shall be securely mounted, compliant with applicable building codes, and sized to accommodate current cabling requirements with allowance for future expansion.

6.2.3. The contractor shall provide standard wall jacks or wall-mounted jacks if cables cannot be put into existing walls.:

6.2.3.1. Wall jacks must have a minimum of two modular ports, allowing for future expansion.

6.2.3.2. Use Cat6A cabling rated for humid environments, supporting 10GbE and fully compliant with ANSI/TIA/EIA standards.

6.2.3.3. Labeling must include color-coded labels integrated with asset management, uniquely identifying each port.

6.2.3.4. Faceplates (if used) should be high-impact, tamper-resistant, aesthetically matching facility design, and support snap-in modules.

6.2.3.5. Installation requires adjustable mounting height, concealed cabling for a clean finish, and full code compliance.

6.2.3.6. Testing must include electronic certification with digital test reports integrated into project records or as built.

6.2.3.7. Deliverables include installed wall jacks (or wall-mounted jacks), as-built drawings, digital documentation, extended warranty, and lifecycle support.

6.2.3.8. Acceptance criteria require ports to pass Cat6A/10GbE certification, documentation integrated with IT asset inventory, and installation meeting safety and code standards.

6.3. FM Building

6.3.1. Wall Mounted Switch Rack (see A.4.5) – Mount on wall in room adjacent to the Facility Managers office. Route new incoming fiber cable from RM to the new rack. The Center of rack should be 48–60 inches (eye level). This shall be the network distribution hub for all wall jacks/wall mounted jacks as well as the fiber hub connecting back to the RM building. The rack shall be lockable and only accessible by IT or maintenance when needed (2 sets of keys produced and given to park administration officer). The rack shall house a universal power supply (see A.4.4) for the switch. Any fiber optic cabling shall have

appropriate conduit and shielding to protect it from damage and include fiber patch panels that are protected.

6.3.2. The Contractor shall furnish and install Cat 6 Ethernet cabling that is outdoor-rated, waterproof, and suitable for deployment in high-humidity environments. Cabling shall utilize solid copper conductors, a UV-resistant LLDPE jacket, and shielding sufficient to mitigate environmental interference. Any cable under buildings shall be protected from rodents using hardened conduit. All materials shall comply with ANSI/TIA-568 standards and be warranted for performance in coastal or tropical conditions. Interior cables shall use aesthetic cable raceways designed to conceal and protect Ethernet and power cabling in occupied spaces. Raceway systems shall be low-profile, paintable, or finished in neutral colors to blend with interior décor, and shall include modular fittings (elbows, tees, end caps) to ensure continuous coverage along walls, baseboards, and ceilings. All raceways shall be securely mounted, compliant with applicable building codes, and sized to accommodate current cabling requirements with allowance for future expansion.

6.3.3. The contractor shall provide standard wall jacks (or wall-mounted jacks) with a port map report:

6.3.3.1. Wall jacks must have a minimum of two modular ports, allowing for future expansion.

6.3.3.2. Use Cat6A cabling rated for humid environments, supporting 10GbE and fully compliant with ANSI/TIA/EIA standards.

6.3.3.3. Labeling must include color-coded labels integrated with asset management, uniquely identifying each port.

6.3.3.4. Faceplates (when used) should be high-impact, tamper-resistant, aesthetically matching facility design, and support snap-in modules.

6.3.3.5. Installation requires adjustable mounting height, concealed cabling for a clean finish, and full code compliance.

6.3.3.6. Testing must include electronic certification with digital test reports integrated into project records or as built.

6.3.3.7. Deliverables include installed wall jacks (or wall-mounted jacks), as-built drawings, digital documentation, extended warranty, and lifecycle support.

6.3.3.8. Acceptance criteria require ports to pass Cat6A/10GbE certification, documentation integrated with IT asset inventory, and installation meeting safety and code standards.

6.4. Bookstore Backroom & Cat6 Extension for Amphitheater Access Point

6.4.1.1. Place Wall mounted cabinet, mount existing Cisco switch inside, provide a UPS within cabinet.

6.4.1.2. Use Cat6A cabling rated for humid environments, supporting 10GbE and fully compliant with ANSI/TIA/EIA standards to route to external site adjacent to amphitheater to mount NPS provided Access Point.

6.4.1.3. Labeling must include color-coded labels integrated with asset management, uniquely identifying each port.

7. Other Requirements

7.1. General Cabling Workmanship Requirements

7.1.1. Workmanship and neat appearance shall be as important as the electrical and mechanical efficiency of the system.

7.1.2. Cable being installed in conduit shall be handled with care and protected from being kinked. A kink is defined for purposes herein as violation of the manufacturer's specified Minimum Bend Radius for each type of cable involved. Cable shall not be formed into a condition that causes the outside sheath to wrinkle. Unsheathed cables shall not be left exposed to the elements. Cable shall be unrolled from the shipping spool and not allowed to spill from the side of the spool.

7.1.3. All cable placement winches and equipment shall be equipped with safeguards that protect the cable against over-tensioning during the placing operation. All cables shall be placed in accordance with manufacturer recommended installation tension specifications.

7.1.4. Operations on or about traffic areas and provisions for regulating traffic shall be subject to the regulation of governmental agencies having jurisdiction over the affected areas.

7.1.5. Keep traffic areas free of excavated material, installation equipment, pipe, and other materials and equipment.

7.1.6. The contractor shall be responsible for replacing, restoring, or bringing to at least original condition any damage to floor, ceilings, walls, furniture, grounds, pavement, etc., caused by its personnel and operations. Any damage or disfiguration shall be restored at the contractor's expense. Contractor shall be responsible for all out of service and damage cases billed by Telecommunication Service Providers.

7.2. NEPA and NHPA Section 106 Compliance Mitigation Requirements

7.2.1. New trenching within historic districts may need to be reviewed for landscape issues based on initial review by the park Archaeologist or designee. In this case an existing conduit lane shall be used and no trenching or digging.

7.2.2. If previously unknown archaeological resources are discovered all work in the vicinity shall cease until the resources can be identified and documented and a mitigation strategy developed by cultural resource specialists.

7.2.3. PUHO has verified that there are no known natural resource impacts along the conduit lane as it will be replacing existing above ground copper.

7.2.4. Contractor shall ensure that ground is re-contoured following ground disturbance.

7.2.5. Contractor shall provide an as-built drawing of the network build for the RM, FM and bookstore facilities.

7.2.6. Care must be taken when excavating trenches for utilities and avoid disturbance to tree root systems.

7.2.7. Soils displaced from the trenching activities shall be replaced in the trench.

7.3. Contractor Worksite Maintenance and Cleanup

7.3.1. The Contractor shall keep the work areas in or near residences and storage areas free from accumulation of waste material and rubbish. Upon completion of the job, the Contractor shall leave the work area and premises in a clean and neat condition.

7.4. Inspection and Safety of Work

7.4.1. Pacific Islands Network IT may inspect the contractor’s installations at any time during the duration of this contract and will witness all reportable testing of installed products. Pacific Islands Network IT Manager will appoint inspection personnel who are responsible for surveillance of the work under this contract and for inspecting and enforcing safety program compliance. If performance defects are identified and validated by quality assurance personnel, the contractor shall be provided with the opportunity to correct the defects and deficiencies. Disputes between the Pacific Islands Network IT Manager and contractor personnel over performance standards shall be referred to the Contracting Officer for final determination. Pacific Islands Network IT reserves the right to inspect all the contractors’ performance to ensure that all installation and related services are received.

7.4.2. The Contractor is responsible for developing and implementing a safety program, a copy of the company's safety plan and a site specific shall be provided to the park facility manager prior to work commencing per Pacific Islands Network IT Construction Policies, including workforce safety and fire prevention that accord with Occupational Safety and Health Administration (OSHA) regulations and PWHO Safety and Health Standards. Contractor shall provide regularly scheduled safety meetings within their team and/or coordinate with Pacific Islands Network IT Manager or representative on site.

7.4.3. Contractor shall provide a minimum of one person equipped with a cell phone for emergency 911 calls and/or communications to local/main/central office safety staff. Knowledge of good cellular coverage has been disclosed at the site.

7.4.4. If the work is to be performed in an area that does not have cell phone coverage PUHO will ensure that an NPS employee is designated as emergency contact and is on site with access to a landline phone and park radio during all work. The Contractor shall be required for initial radio check-out and final check-in prior to completion of project.

7.5. Submittals

7.5.1. The Contractor shall submit records of connectivity testing (including maximum-minimum thresholds), georeferenced as-built AutoCAD drawings, port mapping plans to each switch to each workstation/phone (labelled), and any identified areas of concern that may lead to future improvements of the network.

7.6. Schedule

7.6.1. Before beginning any site work coordinate with Pacific Islands Network IT Manager for this project.

7.6.2. The Contractor shall develop, submit to Pacific Islands Network IT Manager, and maintain a Project Schedule identifying all significant milestones and major tasks, and shall update this schedule in writing, providing copies of the update to Pacific Islands Network Manager, within 5 days of identifying any changes to this schedule. The project schedule shall be marked and identified clearly with the contract number, original date, and any revision number and date, and the name and signature of the responsible Contractor representative.

7.7. Protection of Property and Maintenance of Services

7.7.1. The Contractor shall protect the on-site work areas, all associated and adjacent facilities, and any other Kalaupapa property which may from time to time come into the use or possession of the Contractor under this contract, including utilities, from damages due to the work under this contract.

7.8. As-Built Information

7.8.1. The Contractor shall develop as-built information, including as-built drawings, manufacturer's installation and troubleshooting documents, material cut sheets, and all other records required for the life cycle

operation, support, and maintenance of installed products. As-built data and drawings shall be developed as described herein and submitted prior to the completion of the project.

7.8.2. Contractor-developed drawings submitted in support of this project shall be full-size drawings and submitted as both DWG files, in Auto CAD and Adobe PDF Compatible file format -compatible file format on a Windows-compatible data media. Drawings shall include the Stamped and sealed (signature) of engineer-of-record of the person completing the proposed and/or as-built drawings and shall include the appropriate title block and revision blocks.

7.9. Hours of Operation

7.9.1. The Contractor shall establish daily work periods to meet the Contractor's project schedule for work under this contract at their discretion subject to the following constraints.

7.9.2. Normal work hours for PUHO personnel are generally between 0800 and 1600 daily, on normal (non-holiday) weekdays. The Contractor shall coordinate work outside these weekday hours, or on Saturdays, Sundays, and Federal Holidays, at least 72 hours in advance of the scheduled off-hour work.

A. Attachments

A.1. Attachment 1 - Reference List of Standards and Codes

Work performed under this contract shall use and comply with standards selected from the following sources, in accordance with the Table of References below.

Associated General Contractors (AGC)
American National Standards Institute (ANSI)
American Society for Testing Materials (ASTM)
Building Industries Consulting Services, International (BICSI)
Electronic Industry Alliance/Telecommunications Industry Association (EIA/TIA)
Institute of Electrical and Electronic Engineering (IEEE)
National Electrical Manufacturers Association (NEMA)
National Fire Protection Association (NFPA)

Number	Source	Standard Number	Standard Title
1.	ANSI/TIA	568-C.0	Generic Telecommunications Cable for Customer Premises
2.	ANSI/TIA	568-C.1	Commercial Building Telecommunications Standard
3.	ANSI/TIA	568-C.2	Balanced Twisted-Pair Telecommunications Cabling and Component Standard
4.	ANSI/TIA	568-C.3	Optical Fiber Cabling Components
5.	TIA	526-7	Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
6.	TIA	526-14A	Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant
7.	ANSI/TIA/EIA	569-B	Commercial Building Standard for Telecommunications Pathways and Spaces
8.	ANSI/TIA/EIA	606-A	Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
9.	TIA	J-STD-607-A-2002	Commercial Building Grounding (Earthing) and Bonding Requirements for TIA, October 2002
10.	ISO/IEC	11801:2002	Information Technology – Generic Cabling for Customer Premises
11.	ISO/IEC	14763-1:1999	Information Technology – Implementation and Operation of Customer Premises Cabling, Part 1: Administration
12.	ISO/IEC	14763-2:2000	Information Technology – Implementation and Operation of Customer Premises Cabling, Part 2: Planning and Installation
13.	ISO/IEC	14763-3:2000	Information Technology – Implementation and Operation of Customer Premises Cabling, Part 3: Testing of Optical Fiber Cabling

Number	Source	Standard Number	Standard Title
14.	NFPA	70	*National Electrical Code,* 2014 Edition, National Fire Protection Association, Inc.
15.	NFPA	780	Standard for the Installation of Lightning Protection Systems, latest issue
16.	IEEE	C2-2002	*National Electrical Safety Code, 2016 Edition*, Institute of Electrical and Electronics Engineers, Inc
17.	BICSI		Building Industry Consulting Service International "Telecommunications Distribution Method Manual," latest edition

End of Attachment 1

A.2. Attachment 2 - Performance Verification Test Requirements

A.2.1. Fiber-optic Cabling

Attenuation: The optical fiber cabling link segments shall be tested in both directions at both operating wavelengths to account for attenuation deltas associated with wavelength. Multimode backbone links shall be tested at 850 nm and 1300 nm in accordance with ANSI/EIA/TIA-526-14A, Method B, One- Reference Jumper. Because backbone length and the potential number of splices vary depending upon site conditions, the link attenuation equation shall be used to determine acceptance values based upon this Standard's component requirement at each of the applicable wavelengths.

Link attenuation is calculated as:
Link Attenuation = Cable Attenuation + Connector Insertion loss +
Splice Insertion loss where:
Cable Attenuation (dB) = Attenuation Coefficient (dB/km) X Length (km)

Attenuation Coefficients are:

Attenuation	Wavelength	Mode
3.5 dB/km	850 nm	multimode
1.5 dB/km	1300 nm	multimode
0.5 dB/km	1310 nm	single mode outside plant cable
0.5 dB/km	1550 nm	single mode outside plant cable
1.0 dB/km	1310 nm	single mode inside plant cable
1.0 dB/km	1550 nm	single mode inside plant cable

Connector Insertion loss (dB) = number of connector pairs X connector loss (dB)
Example: = 2 X 0.75 dB = 1.5 dB
Splice Insertion loss (dB) = number of splices (S) X splice loss (dB)
Example: = 2 X 0.3 dB = 0.6dB

A.2.2. Distance and Footprint

A.2.2.1. OTDR testing shall be for length verification only and be conducted in accordance with ANSI/TIA/EIA-526-7

A.2.2.2. Documentation to be recorded for OTDR test results shall include:

- Date of the test
- Description of equipment used, manufacturer model number
- Date of latest equipment calibration
- Test personnel
- Trace of the fiber or cabling link
- Fiber identifier or circuit identifier with fiber length and fiber attenuation of events
- Test

End of Attachment 2

A.3. Attachment 3 – Required Submittals Table

Submittals shall be transmitted, in the number of copies indicated in the following table, to these Pacific Islands network officials/locations:

Deliverable	Format(s)	# of Copies	Notes	
Fiber Optic Network Test	.doc, pdf	2		
Resource Management As built	.dwg, .shp Georeferenced (Horizontal Datum: NAD83 (PA11) • Projection: UTM Zone 4N meters	1	Includes interior conduit/cable types And network jack/outlets	All network jacks labelled on as built and on jacks themselves
Facilities Management As built	.dwg, .shp – Georeferenced (Horizontal Datum: NAD83 (PA11) • Projection: UTM Zone 4N meters	1	Include aboveground conduit connection to RM include under building or outside building wiring runs	All network jacks labelled on as built and on jacks themselves
Overall project site As built	.dwg, .shp - Georeferenced (Horizontal Datum: NAD83 (PA11) • Projection: UTM Zone 5N meters	1	Project site network connections, labelled accordingly	
Cisco 9200 network Switch	24 Port for FM			
Wall Mounted Racks		3	RM, FM, Bookstore	
Universal Power Supply		3	RM, FM, Bookstore	
Outdoor Fiber Optic Cable			RM to FM including fiber patch panel	
Outdoor Rated Cat6			Drops to workstation areas	
Mounted Access Point			AP provided by NPS	Mounted adjacent to amphitheater

End of Attachment 3

A.4. Attachment 4 – List of Drawings

Drawings provided under this contract are informational and intended for the Contractor's use in accomplishing the work required under the contract. The Contractor shall use these drawings as guidelines and basis for identifying, planning and performing installation, but they are not intended to be firm and final detailed installation drawings.

Tabular List of Informational Drawings

Sheet No.	Title
A.4.1	**Location of Project Site (map)**
A.4.2	**Estimated fiber cable run distance**
A.4.3	**Example of Universal Power Supply**
A.4.4	**Example of Wall-Mounted Network Rack**

A.4.1. Location of Project site: 84-5559 Keala o Keawe Rd., Captain Cook, HI 96704 (Bookstore in visitor center), FM & RM

A.4.2. Estimated fiber cable run distance.

A.4.3. Example of Universal Power Supply (Backup Power) like an APC or equivalent to be placed in Rack. May also consider a comparable flat mount UPS.

A.4.4. Example of Wall-Mounted Network Rack

SECURITY WALL MOUNT CABINET

250 lb. weight capacity

Tool-less adjustable cage nut style rails

20" usable depth

19" EIA 310-D compliant

The Wall Mount Cabinet (like the Kendall Howard or equivalent) is a secure, professional looking solution for housing your network, electrical, and peripheral equipment. Many times, small offices or remote locations require expensive data and network equipment to be installed in an open environment. This can lead to problems with employees, customers or others tampering with or destroying devices. With this wall mount enclosure, you can securely mount all of your equipment and eliminate the risk of unauthorized use.

FEATURES

Solid, Secure Enclosure - The durable steel construction features solid sides and a locking front door to keep installed equipment safe.

Click-N-Drop Rails - The included set of cage nut style rails can be adjusted without having to remove nuts and bolts. The Click-N-Drop design only needs to be set and snapped into place. Once secured, install your rackmount equipment with the use of rack screws and cage nuts.

Smoked Acrylic Front Door - The removable locking front door features a smoked acrylic window for easy viewing and monitoring installed equipment.

Open Back Design - The open back design allows already terminated equipment to be fed through the back of the cabinet, saving your installers hours of time re-terminating cables. The large open space is also perfect for applications with an immense amount of cabling which can be fed through the wall directly into the cabinet.

Numerous Cable Knockouts - Multiple laser knockouts are featured on the top and bottom of the enclosure, providing a variety of cable entry points.

Cooling/Ventilation - Optional fan kits can be installed in the top and/or bottom of the security cabinet to help keep equipment from overheating.

End of Attachment 4