

PART 1: GENERAL

The intent of this section is to establish complete service requirements for inspection, testing, verification and documentation of telecommunications infrastructure, cabling and equipment, upon request, at the University of New Mexico Campuses in accordance with these specifications and applicable UNM IT requirements and codes. This specification includes requirements for all types of Commissioning including continuous commissioning, milestone monitoring, acceptance commissioning and network operability, depending upon the project's requirements. It includes the commissioning all types of telecommunications infrastructure work including but not limited to structured cabling systems, network analysis, optical fiber cabling systems, coaxial cabling systems, outside plant cable, duct banks, trenches, maintenance holes, and aerial pole line distribution. The Commissioning contractor, designated agent or employee is held responsible to be familiar with the provisions contained herein and with other Sections of this Specification as applicable to the completion of the installation.

1.01 SCOPE OF WORK

All commissioning will be provided by IT and will be considered to be part of the project scope. The need for commissioning will be determined by IT. Work covered by this Section shall consist of furnishing labor, equipment, supplies, materials, and testing equipment unless otherwise specified, and in performing Commissioning of the Project's Information Technology Cabling and Infrastructure as described on the Drawings and/or required by these specifications.

1.02 QUALIFICATIONS

- A. The Contractor shall send only fully qualified personnel to perform work under this section of work.
 - a. The contractor shall have a fully qualified (RCDD or equivalently qualified) Telecommunications Commissioning Agent overseeing operations for the project.
 - b. Any licensing requirements shall be fulfilled for all work.
 - c. The Contractor shall provide, a complete list of personnel proposed to perform the work, listing their qualifications and experience with the type and size of work required by the project.
 - d. Each Technician Journeyman and Equipment Operator will have a minimum of five (5) years' experience with all applicable telecommunications systems.

- e. The commissioning agents shall be certified by the manufacturer of the testing equipment used to perform the commissioning of the project.

PART 2: PRODUCTS

2.01 PRODUCTS STANDARD

- A. All work performed and commissioned shall be done in accordance to the most current version and requirements of the following references:
 - 1. Division 26, Section 26 00 00 Electrical.
 - 2. Division 27, Section 2700 00 Communications.
 - 3. Division 28, Section 2800 00 Electronic Safety and Security.
 - A. BICSI Wireless Design Manual
 - B. BICSI Customer Owned Outside Plant Design Manual
 - C. BICSI Telecommunications Distribution Design Manual
 - D. Per the systems manufacturer's specifications, installation and warranty requirements.
 - E. National Electrical Code.
 - F. National Electrical Safety Code
 - G. Related NFPA Codes and Standards.
 - H. Underwriters Laboratories or approved Testing Lab.

PART 3: EXECUTION

3.01 Commissioning Contractor Requirements

The Commissioning Contractor must be approved by UNMIT to provide this service for communications projects both on and off campus.

- A. The University of New Mexico owns, operates and maintains a copper and optical fiber cable distribution systems, structured cabling systems, infrastructure and networks serving its Campuses. UNM IT campus system consists of voice and data networks, structured cabling systems, copper and optical fiber inter and intra building cabling and infrastructure systems, wireless voice and data systems, and other support facilities. These systems are considered typical of those found in most University campuses.
- B. Because of the nature of many of the occupancies in UNM Buildings, the efficient operability of voice and data networks is critical to the operations of the University. The efficiency of voice and data networks cannot be verified until the

network is operating at its highest potential or has undergone complete testing under those UNM IT Commissioning, third party verification and acceptance of voice and data facilities is necessary to provide a guarantee of a systems optimal performance.

- C. Work covered by this Section shall consist of furnishing labor, equipment, supplies, materials, and testing equipment unless otherwise specified, and in performing the Commissioning and Testing of the Project's Information Technology Cabling, Infrastructure and Systems as described on the project Drawings and/or required by specification.
- D. The Contractor is expected to have the ability to provide complete testing and verification capabilities.
- E. All test equipment is to be certified, calibrated to meet manufacturers' requirements and meet the performance requirements of Underwriter's Laboratories (UL), ETL – SEMKO, the manufacturer's systems specifications/requirements and most current TIA/EIA standards as it applies to the specified testing application.
- F. Each Contractor shall be knowledgeable of work to be performed by other trades and take necessary steps to integrate and coordinate their work with other trades.
- G. All work performed in occupied spaces shall be in a manner that allows the owner to operate the existing facilities on a continuous basis.
- H. All user outages, including wireless access points, shall be submitted to the UNM IT Department for approval two week before starting work that will affect user connectivity.
- I. The contractor is required to obtain all permits from the proper jurisdiction for all work associated with this specification.
- J. The Contractor is to provide to UNM IT all reports, documentation and test results at the substantial completion in a UNM IT approved format.
- K. All work performed must be compliant with the UNM IT Guide Specifications, Design Guidelines and in accordance with the installed product's manufacturer's instructions and procedures.
- L. UNM IT shall provide technical assistance in identifying/specifying commissioning and testing requirements as they pertain to the specific project.

- M. The UNM IT will provide access to the buildings, premises or facilities. In addition, the Contractor may obtain keys to the buildings and certain areas within them on an "as-needed" basis and with the payment of a refundable per key deposit from the UNM Physical Plant Lock Shop. The contractor is responsible to obtain all training and badges required to perform the commissioning.
- N. The Commissioning Contractor shall arrange directly with the project's contractors for site access not controlled directly by the University. The University will assist the Commissioning Contractor is obtaining access to these area's as needed.
- O. UNM will assist in obtaining entry/access to equipment rooms, tunnels and facilities.
- P. The Work under this contract shall consist of furnishing materials; test equipment and qualified labor to test, evaluate and document communications layer one systems throughout the UNM IT system.
- Q. The Commissioning Agent shall provide certified structured cabling system technicians on site to perform operations related to the testing and evaluation.
- R. The contractor is to commission to all listed and applicable standards including current Technical Service Bulletins (TSB's) and addendums.
- S. The Commissioning Agent shall deliver the following test and reports as specified in the work order for the project:
1. Provide Field Verification and Deficiency Report(s), photographs and installation evaluations of the structured cabling system's infrastructure and spaces. Commission to the most current version of ANSI/TIA 569 – Telecommunications Standard for Pathways and Spaces, UNM IT specifications and guidelines, the National Electrical Code, applicable codes/ordinances, the structured cabling systems manufacturers warranty requirements, the infrastructure system's manufacturers specifications and the project specification and drawings.
 2. Provide Field Verification and Deficiency report (s), photographs and installation evaluation of the grounding and bonding system to TIA 607, UNM IT Specifications and Guidelines the National Electric Code specification and drawings. Include verification of ohms of resistance at

all ground bars.

3. Provide Field Verification and Deficiency report (s), photographs and installation evaluation of labeling for installed systems, infrastructure, facilities and equipment according to the warranty requirements, UNM IT specification, guidelines and the project's specification and drawings.
4. Provide Network Verification and Deficiency report (s), including but not limited to: Network Service Availability, Ethernet Utilization and the presence of network error, port identification, verify link connectivity, verify Power Over Ethernet, service activation documentation, trouble shoot link and, and other network performance and documentation testing as per the manufacturer's specifications or as specified.
5. Provide Field Verification and Deficiency report (s), photographs and installation evaluation of the outside plant copper and optical fiber cable, facilities and infrastructure to EIA/TIA 758A, BICSI Customer Owned Outside Manual Plant Manual, UNM ITS specifications and guidelines, the National Electrical Code, National Electrical Safety Code, applicable codes/ordinances, the structured cabling systems manufacturers warranty requirements, the infrastructure system's manufacturers specifications, cable systems manufacturers specifications and the project specification and drawings.
 - I. Installation evaluation Placement and support Conduits and seals
 - II. Splices – bonding, color coding, neatness, fold back
 - III. Splice cases instructions
 - IV. Manholes and apparatus
 - V. Grounding and bonding
 - VI. Waterproofing compound
 - VII. Labeling
 - VIII. Cleanup
6. Provide Field Verification and Deficiency report (s), photographs and installation evaluation of firestopping.
 - I. Verify proper use of listed applications to applicable codes
 - II. Verify photographs
 - III. Verify labeling
 - IV. Verify submittals

7. Testing of the Optical Fiber
 - A. Test to all TIA/EIA specifications both wavelengths.
 - i. Single mode – TIA 568 ANSI/TIA/EIA-526-7 for single mode fiber
 - ii. ANSI/TIA/EIA-526-14A for multimode fiber
8. Test sample of structured cabling. Include in reports all test results, not only pass/fail
 - I. Category 6– Test to TIA 568 requirements. Link or Channel testing as specified and provide test equipment specified and/or approved by UNM IT.
 - II. Category 6 Augmented F/UTP – Test using Fluke DTX 1800 for Category 6 Augmented. Link and Channel test.
 - III. Comparison of sample testing to contractor test results
9. Provide testing of outside plant copper cable pairs and grounds include:
 - I. Line mapping result: Pass/Fail
 - II. Proper wiring configuration for cable pairs and bundles
 - III. Open conductors – provide
 - IV. footage for failures
 - V. Split pairs
 - VI. Reversed pairs
 - VII. Shorts – provide ohms & provide loop resistance in ohms
 - VIII. Grounds – provide ohms & distance to fault on failures
 - IX. Crossed pairs
 - X. Sheath and ground rod resistance test in ohms
10. Provide all test results in the following format.
 - I. 2 – paper copies bind in notebook form
 - II. 2 – electronic format on Thumb drive
 - III. Provide test results in EXCEL Format
11. Evaluate project drawing and specifications to determine and report deficiencies in design.
12. Verify red lines (as-builts to submittals) to installation to determine and report deficiencies.
- T. Scheduling: Work performed under this Contract shall usually be performed during normal working hours (7 A.M. to 5 P.M.) and on normal working days, Monday through Friday, unless otherwise specifically requested and authorized by a duly designated agent of the University (See paragraph F. below). The

Contractor shall make every attempt to schedule the work so as not to interfere with the operations of the affected project, department or user(s).

- U. UNM designated agent/designee: The name(s) of such duly designated agent(s) shall be supplied to the Contractor within ten (10) days after the date of Contract award.
- V. Work request: The Contractor shall be authorized to perform work through the issuance of a Work Order, executed proposal or other written order issued by the duly designated agent(s) of the University. The order will specify the work location and a general description of the problem or work to be performed. The designee will also provide a briefing on the work to be performed. A copy of the work order authorization, reports, photographs and drawings must be submitted with any invoice for payment and must be signed/authorized by the UNM designee.
- W. Emergency Response: If a work is classified by the University's designee as an "Emergency Request", such work will be scheduled by the Contractor at once and shall automatically authorize the Contractor to perform overtime work if the work must be performed during non-standard working hours.
Response to "Emergency Work" shall be immediate and shall be handled in accordance with this paragraph and the General Conditions.
- X. Identification; while working on campus, all of Contractor's employees are to wear UNM/UNMH identification cards and in addition to uniforms, badges, etc. indicating the Company and preferably the employee's name. The Commissioning agent and their representatives shall be attired in a professional manor with the company's name and logo.
- Y. The Commissioning Agent and their representatives shall provide all personal protection equipment as required by the project.

Communications Commissioning and Acceptance 27 08 00**End of Section**