

SECTION 27 05 00

COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section and the other sections of Division 27.
- B. This section is inclusive to all Division 27 sections.

1.02 SUMMARY

- A. This Section includes general administrative and procedural requirements for the structured cabling system and campus inter-building distribution systems. It includes contractor qualifications, terminations and testing parameters. Reference individual sections for further expansion of these requirements.
- B. Permits, Inspections, Codes and Regulatory References
 - 1. General: Contractor shall obtain and pay for all permits and inspections required by laws, ordinances, rules, and regulations having jurisdiction for work included under this Contract and shall submit approval certificates to the Technology Consultant.
 - 2. Codes: The cabling system installation shall comply fully with all local, county and state laws, ordinances and regulations applicable to electronic and electrical installations.
 - 3. The following industry standards are the basis for the structured cabling system described in this document:
 - a. TIA-568-D Commercial Building Telecommunications Cabling Standard
 - b. TIA-568-D.1 General Requirements
 - c. TIA-568-D.2 Balanced Twisted Pair Cabling Components Standard
 - d. TIA-568-D.3 Optical Fiber Cabling Components Standard
 - e. TIA-569-D Commercial Building Standard for Telecommunications Pathways
 - f. TIA-606-B Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - g. TIA-607-D Commercial Building Grounding/Bonding Requirements
 - h. NFPA National Fire Protection Association
 - i. NFPA 70 National Electric Code (NEC)
 - j. ISO/IEC International Organization of Standards/International Electrotechnical Commission
 - k. ISO 11801 Generic Cabling for Customer Premises
- C. If there is a conflict between applicable documents, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the

documents. The Contractor has the responsibility to determine and adhere to the most recent release when developing the proposal for installation.

- D. This document does not replace any code, either partially or wholly. The contractor must be aware of local codes that may impact this project.

1.03 ABBREVIATIONS AND DEFINITIONS

- A. General: In addition to abbreviations defined in Division 1, utilize the following abbreviations and definitions for discernment with the Drawings and Specifications.

B. Abbreviations:

1. ANSI American National Standards Institute
2. ASA American Standards Association
3. ASTM American Society of Testing Materials
4. AVC Audiovisual Contractor
5. EC Electrical Contractor
6. EIA Electronic Industry Association
7. ETL Electrical Testing Laboratories, Inc.
8. GC General Contractor
9. ICEA International Cable Engineers Association
10. ICIA International Communications Industries Association
11. IEEE Institute of Electrical and Electronics Engineers
12. NEC National Electric Code
13. NEMA National Electrical Manufacturers Association
14. NFPA National Fire Protection Association
15. NIC Not In Contract
16. NRTL Nationally Recognized Testing Laboratory
17. O Owner
18. OEM Original Equipment Manufacturers
19. OSHA Occupational Safety and Health Administration
20. OSP Outside Plant
21. SCC Structured Cable Contractor
22. TC Technology Consultant
23. TIA Telecommunications Industry Association
24. UL Underwriter's Laboratories, Inc.

C. Definitions:

1. ACCEPTED means as accepted by the Technology Consultant or his representative.
2. APPROVED means as approved by the Technology Consultant or his representative.
3. ARCHITECT means Eskew+Dumez+Ripple or their designated representative.
4. AS DIRECTED means as directed by the Technology Consultant or his representative.
5. AS REQUIRED means as required by some other part of the contract documents which may include reference specifications or manufacturer's recommended practice.
6. AS SHOWN means as shown on the drawings, shop drawings or other graphical elements of the contract documents.
7. BIDDER is used to indicate that entity generating the bid response.

8. CONCEALED means embedded in masonry or other construction, installed behind wall furring or within double partitions or installed within hung ceilings.
 9. CONDUIT means the inclusion of all fittings, hangers, supports, sleeves, etc.
 10. CONTRACTOR is used to indicate the successful Bidder to whom the Owner has awarded the contract.
 11. EQUAL means equivalent as approved by the Technology Consultant or his representative.
 12. FURNISH means to indicate the responsibility to ship or deliver the item to the job site, freight prepaid, for receipt, staging and installation by others.
 13. INSTALL means to join, unite, fasten, link, attach, setup or otherwise connect together before testing and turning over to Owner, complete and ready for regular operation, the particular work referred to. It is also used to indicate the responsibility of receiving the item at the job site, providing adequate storage, unpacking or uncrating the item, physically securing the item or otherwise making ready the item for its intended use by following the instructions and approved methods of the manufacturer and those contained herein.
 14. OWNER or CLIENT means Louisiana State University or their designated representative.
 15. OWNER FURNISHED CONTRACTOR INSTALLED (OFICI) shall refer to equipment that will be furnished by the Owner for installation by the Contractor. The Contractor shall be responsible for installing and integrating this equipment as detailed herein.
 16. PROVIDE means to furnish, install, place, erect, connect, test and turn over to Owner complete and ready for the regular operation, the particular work referred to.
 17. PROVIDED BY OTHERS shall refer to material and work, which is related to this contract, but has been provided by parties other than the Contractor.
 18. SPECIFICATION is defined as the body of documentation provided to the Contractor with the Request for Quotation, as well as all addenda to said documentation. Throughout this document, words such as “herein” refer to the entire Specification, and not just this written document. The Specification includes, but is not limited to, this written specification document, all drawings, as listed in the List of Drawings, cable terminations and labeling schedule, additions and/or modifications as detailed in written addenda, additions and/or modifications as detailed in drawing additions or reissues.
 19. TECHNOLOGY CONSULTANT refers to The Sextant Group, Inc., 3606 North 156th Street, Suite 101/310, Omaha, NE 68116.
 20. The term SHALL is mandatory; the term WILL is informative; and the term SHOULD is advisory.
 21. WIRING means the inclusion of all raceways, fittings, conductors, connectors, patch panels, labeling, junction and outlet boxes, connections, testing and all other items necessary and/or required in connection with such work.
- D. For the purpose of Division 27, in the event of conflict with an abbreviation or definition in Division 1 and in Division 27, the Division 27 abbreviation or definition shall prevail.

1.04 PERMITS, CODES, STANDARDS, AND INSPECTIONS

- A. Contractor shall obtain and pay for all permits and inspections required by laws, ordinances, rules and regulations having jurisdiction for work included under this Contract and shall submit approval certificates to the Technology Consultant.

- B. The installation shall comply fully with all local, county and state laws, ordinances and regulations applicable to electronic and electrical installations.
- C. Unless stated in Division 1, the installation shall be in compliance with the requirements of the latest revisions of:
 - 1. All approved published instructions set forth by equipment manufacturers.
 - 2. All local codes and ordinances in effect and having jurisdiction.
 - 3. Americans with Disabilities Act (ADA)
 - 4. All requirements of electric and telephone utility companies
 - 5. BICSI Telecommunications Distribution Methods Manual (latest edition)
 - 6. Building Officials and Code Administrators (BOCA)
 - 7. Electronic Industry Association (EIA)
 - 8. Institute of Electrical and Electronic Engineers (IEEE)
 - 9. Legislative Act 235 (1965)-Handicapped
 - 10. Legislative Act 287 (1974)-Excavation
 - 11. National Board of Fire Underwriter's (NBFU)
 - 12. National Electric Code (NEC)
 - 13. National Electrical Manufacturer's Association (NEMA)
 - 14. National Electric Safety Code (NESC)
 - 15. Occupational Safety and Health Act (OSHA)
 - 16. Telecommunications Industry Association (TIA)
- D. Submit certificates issued by approved authorized agencies to indicate conformance of all work with the above requirements, as well as any additional certificates as may be required for the performance of this contract work.
- E. Should any change in drawings or Specifications be required to comply with governmental regulations, the Contractor shall notify the Technology Consultant prior to execution of the work. The work shall be carried out according to the requirements of such code in accordance with the instructions of the Architect and the Technology Consultant at no additional cost to the Owner.

1.05 CONTRACTOR QUALIFICATIONS

- A. All bidders shall demonstrate their qualifications by providing the following documents:
 - 1. A list of the LAST five (5) Structured Cabling systems that were installed by the bidder:
 - 2. The listing shall include only systems that included the installation of fiber optic cable and Category 6 or 6A twisted pair.
 - 3. The listings shall be for the last five (5) projects that are completed and have been turned over to the owner.
 - 4. The listing shall include a brief description of the project, size of the system, products used, Owner's name, phone number, address, and representative, date started, and date of completion
- B. The bidder shall furnish a list of all test equipment that will be used in the installation and testing of the fiber optics, multi pair copper distribution and UTP cable.

- C. Performance testing of Category 6A UTP cable will be completed using a Fluke DSX2-8000-NW Cable Analyzer. Performance testing of fiber optic cable will be completed using an OTDR. Proof of valid and current test equipment calibration and firmware must be provided to owner 30 days prior to testing.
- D. The bidder shall furnish a listing of the names of full-time employees that will work on the project and list their training and certification in the installations and testing of structured cabling. At all times through the duration of the project a minimum of 50% of the on-site cabling personnel including the project lead will be BICSI Certified Installers (ITS Installer 1). Submit the BICSI Installer Certificates with bid.
- E. The bidder shall have a Registered Communication Distribution Designer (RCDD) with five (5) years' experience, on staff. Submit the RCDD Certificate and project information with bid.
- F. All of the above documents shall be submitted along with the Bid Form, by the Bid due date.
- G. The Contractor shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data and voice network systems. The Contractor shall at a minimum possess the following qualifications:
 - 1. Those licenses/permits required to perform telecommunications installations in the specified jurisdiction.
 - 2. Personnel trained and certified in the design of the Panduit/Belden Cabling System. Submit the Cabling System Design Certificates with bid.
 - 3. Personnel trained and certified to install the Panduit/Belden Cabling System. Submit the Cabling System Installation Certificates with bid.
- H. Personnel must be knowledgeable in local, state, and national codes, and regulations. All work shall comply with the latest revision of the codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall apply.
- I. The Contractor shall have been in the business of installing structured cabling systems for a minimum of five (5) years.
- J. The Contractor must possess and maintain current liability insurance certificates.

1.06 WARRANTIES

- A. Provide complete written warranty information for each item to include date of beginning of warranty or bond; and names, addresses, telephone numbers and procedures for filing a claim and obtaining warranty services.
- B. Warranty and Certification of the Cabling systems and connectors:

- C. The Contractor shall provide a minimum 25-year performance and product warranty that installation, cable, connectors and connecting hardware shall be free from defects in material, workmanship and fabrication. Submit detailed warranty documentation with close out documentation.
- D. The system shall be certified by the cable/connector manufacturer and warranted for the specified performance for minimum of 25-years. The Contractor shall conform to the manufacturer's certification including submittals of all required documentation to the manufacturer.
- E. The Contractor shall obtain, from the manufacturer, a Registration Document and Certificate for the specific installation issued in the Owner's name. Upon receipt of the Registration Document and Certificate, the Contractor shall forward a copy to the Technology Consultant and deliver the original to the Owner.
- F. Any material, equipment or appurtenance whose operation or performance does not comply with the requirements of the Contract or any equipment which is damaged prior to acceptance will be held as defective and shall be removed and properly replaced at no additional cost to the Owner.

1.07 SUBMITTALS

- A. The contractor shall provide product submittals for all system components. These components shall include all cable, termination devices; splice connectors, patch panels, associated racks and enclosures, patch cords and labeling devices. The selected contractor will allow sufficient time in project scheduling for client and review by the Architect's Technology Consultant.

1.08 PROJECT DRAWINGS AND SPECIFICATIONS

- A. The Contractor shall carefully examine the Drawings and Specifications of all trades and report discrepancies to the Technology Consultant in writing to obtain corrective action. No departures from the Contract Documents will be made without prior written approval from the Technology Consultant.
- B. Questions or disputes regarding the intent or meaning of Contract Documents shall be resolved by the interpretation of the Technology Consultant. The Architects' interpretation is final and binding.
- C. The Drawings and Specifications are not intended to define all details, finish materials, and special construction, which may be required or necessary. The Contractor shall provide all installations complete and adequate as implied by the project documents.
- D. Drawings are diagrammatic only and do not show exact routes and locations of equipment and associated wiring. The Contractor shall verify the work of all other trades and shall

arrange his work to avoid conflicts. In the event of a conflict, the Contractor shall obtain corrective action from the Technology Consultant.

- E. If there is a conflict between contract documents, the document highest in precedence shall control. The precedence shall be: first; permits from agencies as required by law, second; special provisions, third; specifications, fourth; drawings, fifth; reference specifications and sixth; vendor submittals.

1.09 COOPERATION AND COORDINATION WITH OTHER TRADES

- A. The Structured Cabling Contractor shall be responsible for all cross connecting and coordination with vendors and other trades to provide a complete operational system.

1.10 PRODUCT LISTING

- A. When two or more items of the same material or equipment are required, they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, conduit, fittings, sheet metal, solder, fasteners, and similar items, except as otherwise indicated.
- B. Provide products that are compatible within systems and other connected items.
- C. All powered equipment shall be UL listed and follow approval criteria defined by the local authority having jurisdiction.

1.11 RECORD DOCUMENTS

- A. When all work has been completed and before final acceptance, the Contractor shall furnish to the Technology Consultant and Owner a complete set of documents that clearly represent all contract work “as-built”. This shall be inclusive of all test results and drawings. The Contractor is responsible for assuring the accuracy of the As-Built documentation.
- B. As part of the completed “As-Built” document package the Contractor will deliver a final cable plant matrix (in spreadsheet format) of Category 6A outlets and floor plan with reference numbers. Final “As-Built” drawings will be delivered in AutoCAD format.

1.12 MAINTENANCE MANUALS

- A. Prepare maintenance manuals (Record Document) in accordance with the following information for equipment items:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer’s data of each piece of equipment.

1.13 GENERAL WARRANTIES

- A. Provide complete warranty information for each item to include date of beginning of warranty or bond; and names, addresses, telephone numbers and procedures for filing a claim and obtaining warranty services.
- B. Any material, equipment or appurtenance whose operation or performance does not comply with the requirements of the Contract Documents or which are damaged prior to acceptance will be held as defective and shall be removed and properly replaced at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 GENERAL

- A. Major items of equipment shall have manufacturer's name, address and catalog number on a plate securely attached. All equipment or apparatus of any one system must be the product of one manufacturer or approved equivalent products of a number of manufacturer's that are suitable for use in a unified system.
- B. All materials and equipment for which Underwriter's Laboratories have established standards shall bear a UL label of approval.
- C. Where proprietary names are used, whether or not followed by the words "or as approved", they shall be subject to substitution only as approved by the Architect, Technology Consultant, and Owner.
- D. Where the Contractor proposes substitute equipment, contractor shall submit acceptable evidence to indicate compliance with all requirements of the documents, including performance rating, size and resistance to wear and deterioration equivalent to the specified item. In instances where substituted equipment requires additional material or work beyond that shown or required by the specified item, said additional material or work, shall be the responsibility of this Contractor, regardless of the trade involved.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project identified with names, model numbers, types, grades, compliance labels, and other information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage and handling.

3.02 INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of systems, materials, and equipment.

- B. Coordinate systems, equipment, and materials installation with other building components.
- C. Verify all dimensions by field measurements.
- D. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for cabling installations.
- E. Sequence, coordinate, and integrate installations of cabling materials and equipment for efficient flow of the Work.
- F. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components.
- G. Coordinate the cutting and patching of building components to accommodate installation of cabling equipment and materials.
- H. Coordinate the installation of all materials and equipment above ceilings with suspension system, mechanical equipment and systems, and structural components.
- I. Install equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations.
- J. Plywood on MDF/IDF walls shall be void-free fire-resistant grade AC grade or better with a minimum thickness of 0.75 inches with two coats of fire-resistant paint on all useable walls. Use flush hardware and supports to mount plywood. Ensure that the strength and placement of the hardware are sufficient to handle the total anticipated load and mounting of cabling components.
- K. Ensure that the fire rating of all walls and floors is maintained. Plywood backboard sheets will have the fire-rated stamp left visible for inspection.

3.03 CONDUIT AND RACEWAY

- A. Actual locations of all equipment, raceways, junction boxes, cable runs, conduit runs, etc., shall be determined at the site.
- B. Provide a pull box or pull point immediately before and after any conduit or raceway section containing three ninety-degree bends, or any single run exceeding fifty feet in length. Pull box openings must face in the direction from which personnel will approach and must have a minimum eight inches in front of and to all sides of the opening. Pull boxes shall not be used in place of a bend. Conduits must always exit the pull box from the opposite side it entered (no change of direction inside the pull box will be accepted).
- C. Carefully investigate the structural, electrical/electronic and finished conditions of work accordingly.

3.04 FIRESTOPPING

A. General

1. Provide through penetration fire stop systems to prevent the spread of fire through openings made in fire-rated walls or floors to accommodate penetrating items such as conduit, cables and cable tray. Fire stop shall restore floor and wall to the original fire rated integrity and shall be waterproof. The fire stop systems and products shall have been tested in accordance with the procedures of U.L. and material shall be U.L. classified as materials for use in through-penetration fire stops.
2. The fire stop system shall comply with the NEC and with NFPA 101-Life Safety Code (latest edition) and shall be made available for inspection by the local inspection authorities prior to cable system acceptance. The contractor shall be responsible for verifying the fire rating of all walls and floors having cabling penetrations. Coordinate sealant installation with work of other trades and with the general contractor on site.
3. Fire stop systems shall be UL Classified to ASTM E814 (UL 1479) or shall be approved by a qualified Professional Engineer (PE), licensed in the state of Louisiana.
4. A drawing showing the proposed fire stop system shall be provided to the Owner and Technology Consultant prior to installing the fire stop system(s).

3.05 GROUNDING AND BONDING

- A. Ground communications systems and equipment in accordance with the ANSI/TIA-607-D Grounding Standard and NEC requirements except where the Drawings or Specifications exceed NEC requirements. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, paging equipment, CATV equipment etc. entering or residing in technology spaces shall be grounded to the respective ground system using a minimum #6 AWG solid copper bonding conductor and compression connectors. All wires used for technology grounding purposes shall be identified with green insulated wires. All cables and bus bars shall be identified and labeled in accordance with the Technology Identification requirements.

3.06 TESTING

- A. Contractor, at his own expense, shall make any tests directed by an inspection authority or by the Technology Consultant and shall provide all equipment, instruments and materials to make such tests.
- B. Upon completion of work, all component parts, both singularly and as a whole, shall be set, calibrated, adjusted and left in satisfactory operation condition to suit load conditions, by means of instruments furnished by the Contractor.
- C. Notify the Owner and Technology Consultant seven (7) days prior to the testing dates. Upon completion of a test, a statement of certification shall be forwarded to the Technology Consultant for his approval.

END OF SECTION