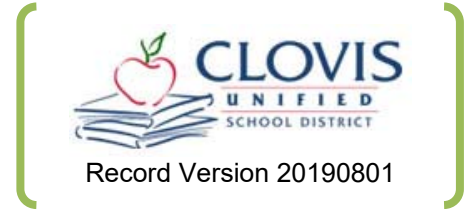


DIVISION 27 – COMMUNICATIONS



270000 – COMMUNICATIONS GENERAL

Part 1 - General

1.1 Related Sections

- A. This specification section provides general conditions for all division 27 specifications. All contractors working with in the division 27 specification shall adhere to this specification and these related specifications:
 - Section 270528 Communication Infrastructure Systems
 - Section 271000 Structured Cabling System
 - Section 272010 Uninterruptable Power Supply
 - Section 274040 Assistive Listening System
 - Section 274200 Classroom Amplification System
 - Section 274220 Multi-Purpose Sound System
 - Section 275313 Analog Synchronous Clocks
 - Section 277000 Intercom-Clock-PA System
 - Section 278000 Video Surveillance System

1.2 Statement of Work

- A. This document describes the requirements for the contractors, products and installation relating to furnishing and installing Structured Cabling and Communications Systems.
- B. Contractor will provide a bid including all labor, materials, tools and equipment required for the complete installation of work called for on the Construction Drawings and described in this Document. It is the responsibility of the Contractor to provide all material necessary to provide a complete and operable system. If the contractor feels that the system described is incomplete they must address this in writing to the Owner/Owner's Representative before providing a bid.
- C. All questions concerning non-specified product and services will be address to the Owner's Representative before Contactor provides a bid. Owner expects that by accepting the Contractor's bid proposal that the Contractor has provided a competent bid for a complete solution.
- D. Product specifications, general design considerations, and installation guidelines are provided in this document. Quantities of devices, typical installation details, and mounting details will be provided as an attachment to this document. The successful vendor shall meet or exceed all requirements for the systems described in this document.
- E. Contractors DO NOT remove Owner network equipment without written approval from the Owner.

1.3 Existing cabling and systems equipment

- A. Demolition of cabling systems per CEC 2013
 - 1. Remove all cabling defined for demolition per CEC 640.2, 640.6.C, 645.2, 645.5.F, 725.2, 725.25, 770.2, 770.25, 770.154.A, 800.2, 800.25, 800.154.A, 820.2, 820.25, 820.154, 830.2, 830.25,
 - 2. The owner shall be given "first right of refusal" for all decommissioned equipment and removed cable.
 - 3. The owner may wish to keep, recycle or destroy these items. If the items are refused by the owner the contractor may keep, recycle or destroy these items.
 - 4. Owner will establish a location for all materials it wishes to keep, recycle or destroy.
- B. Contractor SHALL NOT demo any existing analog telephone cables or outlets, except where complete reconstruction occurs. The existing telephone cabling will

remain intact and used by the district upon re-occupancy. Contractor shall repair any telephone cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed.

- C. Contractor SHALL NOT demo any existing intercom cables or outlets, except where complete reconstruction occurs. The existing intercom cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any intercom cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed.
- D. Contractor SHALL NOT demo any existing coaxial CATV cables or outlets, except where complete reconstruction occurs. The cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed.
- E. Contractor SHALL NOT demo any existing CCTV cables, outlets, or cameras except where complete reconstruction occurs. The existing cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed. Coordinate with Owner for the removal of any cameras in the way of the scope of work. Owner will remove existing cameras.
- F. Contractor to coordinate with the Owner for the scheduled removal of any existing network equipment, such as, but not limited to, wireless access points, access point mounting brackets, network switches, and network routers. All equipment is to be removed by Owner and NOT the contractor. Owner will remove and re-install any network equipment unless specifically coordinated with Contractor.

1.4 Regulatory References

- A. Contractor will comply with all Federal, State, Local Codes/Regulations and Industry Standards.
 - 1. Federal:
 - California Electric Code(CEC) 2013 or latest approved
Chapter 8: "Communications Systems"
Article 250: "Grounding"
 - NFPA 70 - National Electric Code(NEC)
 - FCC - Part 15, Part 68
 - ADA – Americans with Disabilities Act
 - 2. State of California:
 - CCR Part 2 - California Building Code.
 - CCR Part 3 - California Electrical Code
 - Occupational Safety and Health Act (OSHA).
 - Title 24, Building Standards, State of California.
 - Title 19, California Code of Regulations.
 - Title 8, Electrical Safety, State of California
 - 3. ANSI Standards
 - ANSI C2-2001 National Electrical Safety Code.
 - ANSI C80.3 Specification for Zinc-coated Electrical Metallic Tubing.
 - ANSI/UL 797 Electrical Metallic Tubing.
 - ANSI/ICEA S-83-596-2001 - Fiber Optic Premises Distribution Cable Technical Requirements.
 - 4. Industry Standards:
 - Telecommunications Industry Associations/Electronics Industry Association (TIA/EIA)
 - TIA/EIA-568.0-D Commercial Building Telecommunications Cabling Standard
 - TIA/EIA-568-1.D General Requirements
 - TIA/EIA-568-C.2 Balanced Twisted Pair Cabling Components Standard

TIA/EIA-568-3-D	Optical Fiber Cabling Components Standard
TIA/EIA-569-A	Commercial Building Standard for Telecom Pathways and Spaces
TIA/EIA-606	Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
TIA/EIA-607	Commercial Building Grounding/Bonding Requirements
TIA/EIA-758	Customer-Owned Outside Plant Telecommunications Cabling Standard
TIA/EIA-758-1	Addendum No. 1 to TIA/EIA-758, Customer-Owned Outside Plant Telecommunications Cabling Standard

- National Electrical Manufacturer's Association (NEMA)
- Institute of Electrical and Electronic Engineers (IEEE)
 - 802.3 (Ethernet)
 - 802.3ab (Gigabit Ethernet over 4-pair Category 5e, 6 & 6A or higher)
 - 802.3Z (Gigabit Ethernet over optical fiber)
 - 802.11ac (Wireless LAN Specifications)
- Underwriters Laboratories Inc. (UL)
- International Organization for Standardization/International Electromagnetic Commission (ISO/IEC) ISO 11801 Generic Cabling for Customer Premises
- Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM 13th Edition or latest).
- ASCII - American Standard Code for information Interchange
- ASTM - American Society for Testing and Materials

- B. 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.
- C. This document does not replace any code, either partially or wholly. The contractor must be aware of and comply with all local codes that may impact this project.

1.5 Safety/Contractor Qualifications/Quality Assurance

- A. Safety and Indemnity
1. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of persons and property during performance of work.
 2. The Contractor shall ensure that all personnel working in or anywhere on the site shall be provided a hard hat, safety shoes, a face shield or safety goggles, etc. for their protection.
 3. No act, service, drawing review or construction observance by the owner's representative or any other party employed by the campus is intended to include review or approval of adequacy of the Contractor's safety measures, in, on or near the construction site.
- B. Contractor Qualifications
1. Each low voltage contractor/sub-contractor shall submit their qualifications to the district prior to award of contracts.
 2. Contractor shall have been in business for no less than five (5) years and have installed of a minimum of 3 projects of similar size and scope.
 3. A *Manufacturer Certified Installer* contractor, currently certified in the Owner's standard solutions, shall complete the System installation. The contractor shall have completed standards based product and installation training. **A copy of the Contractor's Manufacturer Certified Installer certificate shall be submitted with their submittal.**
 4. Sub-Contractor Qualifications
 - All Contractors shall submit a list of at least three (3) projects of similar dollar volume completed within the past 24 months for reference purposes.
 - The Contractor shall compile detailed information relating to similar work completed, including corporate references sufficient to enable the Owner to

evaluate and agree to the Contractors' responsibility, experience and capacity to perform the work.

- Each Contractor to perform telecommunications work on this project shall possess a C-10 or C-7 (formerly C-61) Limited Specialty License for Telecommunications and must be certified for the installation, termination, splicing, and testing of copper cables, fiber optic cable, riser cable, and inside wiring. The appropriate contractor's license for underground construction and conduit installation is also required.
 - An on-site Contractor superintendent must be available at all times. Contact can be by person or telephone.
5. Contractors who do not meet the minimum specified requirements will not be accepted.

C. Quality Assurance

Contractors are required to comply with the following without exception:

1. The winning Contractor will assign this project to a competent Project Manager who has demonstrated their ability to supervise a telecommunications project of the same size and scope.
 - The contractor will make this person available to the Owner/Owner's Representative before the start of this project for an interview. This person must be deemed acceptable by the Owner and/or their Representative before work can begin.
 - Project Manager will be required to be available for scheduled on site project meetings at no additional cost to the Owner.
 - Project Manager will be required to be available to meet on site with the Owner/Owner's representative with a minimum of 24 hours' notice for non-emergency issues, and a minimum of 4 hours for emergency issues at no additional cost to the Owner.
2. All material and equipment to be installed on this project shall be "new". If the Owner/Owner's Representative discovers that "used" material or equipment has been installed on this project the Contractor will be required to replace said materials and/or equipment with "new" products at no additional cost to the Owner.
 - "New" - Materials and products manufactured within one (1) year prior to installation, and meet or exceed the latest published specifications of the manufacturer. Also these materials and equipment may not have been in use before installation on this project unless directed otherwise in the project documents.
3. Contractor must warranty all materials, equipment and labor for a minimum of one (1) year from the Owner's acceptance of the work.
 - Warranty will provide repair/replacement of all defective or improperly installed materials at no additional cost to the Owner (including Labor, drive time, shipping, taxes, etc.).
 - Contractor is required to keep in stock replacement parts for all items covered in this specification and provide a competent service technician to be on site to repair/replace defective items no later than 24hours after receiving trouble call.
 - Warranty will cover normal Business hours, 8am – 5pm, Monday thru Friday. All calls received on a Friday or the day before a holiday will be held until the following regular business day.
4. Contractor must submit for full manufacturer extended warranty upon completion of the project. Warranty certificate to be sent directly to Owner.

1.6 Submittal Documentation

- A. The successful contractor shall provide their submittal package in accordance with the Section 01 20 00 1.06 Submittal Schedule
- B. The successful contractor shall provide three (3) copies of their submittal package.

- C. The Submittal Package will include:
1. All documentation given will be in a Bond Cover or in a Three (3) Ring Binder.
 2. A coversheet on the Contractor's Company Letterhead including:
 - Contractor's Name
 - Contractor's License Number
 - The Project Name
 - The Specification Number and Description
 - The date documentation was submitted.
 3. A spreadsheet with a full material list of products and equipment included in the Contractor's bid price. Spreadsheet will provide:
 - Manufacture Name
 - Part Number
 - Description
 - Quantity to be installed for each part.
 4. A legible copy of the Manufacturer's Catalog Cut sheet for each part included in the Contractor's bid.
 - The Catalog Cut sheets shall be placed in the same order as shown on the spreadsheet.
 5. Copies of the Manufacturer's Certification for a minimum of the Project Forman and 50% of the installation crew.
 6. Sample of Labeling Scheme. Contractor will provide a sample for each identifier to be used on this project. Labels are to be approved by Owner prior to printing.
- D. LEED/CHIPS/HPSA (when applicable to project provide additional submittal information)
1. Recycled content, segregated by pre- and post-consumer percentages.
 2. Rapidly renewable material content.
 3. VOC content
 4. Distances from site to follow material process locations.
 - Raw material harvest, collection or extraction
 - Product or component fabrication
 - Final material manufacture, if different than component fabrication

1.7 Equivalent Products

- A. Pre-Approved Equals:
1. All pre-approved products shall be listed in the relevant specification section.
- B. Contractors wishing to approve a system other than those specified in this document will be required to perform the following:
- Provide System specifications and cut sheets for all system components for the proposed new system(s).
 - Provide an itemized comparison to each of the system functions as described in this specification. Include in that document how the proposed system compares to the specified system described in this document on a line by line basis, using one of the following three criteria: "exceeds"/"matches"/ "unequal".
- C. All other products than those specifically address in the bid document that the Contractor is seeking approvals for must be **received** by the Owner's Representative **no later than 5 business days before the bid date**. All Approved Equals will be published in addendum form prior to the bid date.
- D. Failure to received written approval for product installed that deviates from the products called for in this specification and/or on the project drawings will result in the contractor having to replace the unapproved materials and equipment with the originally specified products at no additional cost to the Owner.
- E. All proposed system documentation must be sent to the Owner's Representative via one of the following; mail, fax or email. The Contractor will include the project name, their contact information, and the specification section number that the proposed system is comparable to.

1.8 Acceptance and Warranties

A. Project Acceptance

1. The Owner and the Contractor shall accept the project as complete based on the following criteria:
 - Before executing any performance testing, the Contractor shall present a test plan to the Project Engineer for their approval.
 - The Contractor has completed all testing and delivered copies of all test results to the owner's representative.
 - All test results have been examined and approved by the Contractor and the Project Engineer.
 - Copies of all documentation required by this section have been delivered to the Project Engineer.
 - All punch list items are completed to the satisfaction of the Inspector-of-Record.
 - Manufacturer Warranty Certification Certificates are provided to the Owner.
2. Following completion and/or compliance with the requirements listed above, the Contractor shall issue a Notice of Completion confirming that the project is complete. A 45-day acceptance period shall begin immediately following the issuance of the Notice of Completion.
3. Minor failures shall be responded to at the Owner's discretion or within one business day.

B. Manufacturer Warranties

1. The installed 271000 structured wiring (as applicable for given cable media) system, including both inter-building and intra-building sub-systems, shall be warranted by a manufacturer for a 15-year period or greater. Lifetime warranty is the warranty period preferred by the Owner and will be given preference where applicable.
2. The warranty certified systems will be a complete system comprised of products from a single solution manufacturer, warranted to operate as a guaranteed system for the entire channel (cords, telecommunications outlet/connectors, cables, cross-connects, patch panels, etc.). The Solution Manufacturer shall administer a follow on program through the Vendor to provide support and service to the purchaser, and a single extended warranty point of contact. In the event that the certified system ceases to support the certified application(s), whether at the time of cutover, during normal use or when upgrading, the manufacturer and vendor shall commit to promptly implement corrective action.
3. The Contractor shall be responsible for correcting any problems and malfunctions that are warranty-related for the entire warranty period. In the event that a Contractor should not be in business at the time of an issue, the manufacturer shall be responsible for all corrections, if deemed the responsible party.
4. Copies of any extended material warranties shall be passed through to the Owner.
5. During the installation and up to the date of final acceptance, the Contractor shall protect all finished and unfinished work against damage and loss. In the event of such damage or loss, the Contractor shall replace or repair such work at no cost to the Owner or any other Trade Partnership working on the project.

END OF SECTION