CITY OF FORT WAYNE MASTER UPDATED: 6/20/2017

SECTION 27 00 00

Communications

NTS: Use this section when the computers and software for a site’s SCADA system are in the project scope. This section shall be used when other Division 27 Specifications are used.

1. ‑ GENERAL
   1. DESCRIPTION
      1. Scope:
         1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish, install, test, start up, and place in satisfactory operation complete communication system that includes the Process Control Network (PCN) and Business Information Network (BIN). System shall be as specified in the applicable Specifications and as shown. System includes the following equipment:

NTS: Insert at (--1--) a list of major equipment items covered in this section, such as: “Workstation computers”, “Network server computer”, “Historian computer”, “Network switch”, “Printers”, “Cameras”, “Door Access Control”, “Phones” and others.

* + - * 1. (--1--).
      1. Process Control Network and Business Information Network shall be two independent physically separated systems.
      2. Process Control Network (PCN) shall allow computers to share data and use common equipment, such as PLCs, VFDs, power monitors, HMIs, and SCADA.
      3. Business Information Network (BIN) shall allow computers to share data and use common equipment, such as printers and hard drives.
      4. Contractor is responsible for the work specified in this section. Work by Supplier shall not relieve Contractor of responsibility for the communication computers and computer network.
         1. Designing, fabricating, and implementing of communication computers and computer network and all subsystems in accordance with the Contract Documents.
         2. Preparing, assembling, and correcting all communication computers and computer network submittals in accordance with the Contract Documents.
         3. Proper interfacing of communication computers and computer network hardware and software. Interfacing shall be coordinated with Owner.
         4. Supervising installation of communication computers and computer network.
         5. Testing and start‑up of communication computers and computer network.
         6. All warranty obligations for computers and network components.
         7. Maintaining two reproducible copies of complete system and running software at Supplier’s facility throughout the correction period.
    1. Related Sections:
       1. Division 26 Electrical
       2. Division 27 Communications
       3. Division 40 Process Integration
  1. QUALITY ASSURANCE

NTS: If Contractor and Supplier are the same entity, substitute the word “Contractor” in place of “Supplier” throughout paragraph “A”.

* + 1. Qualifications:
       1. Supplier shall be financially sound with at least five years continuous experience in designing, implementing, supplying, and supporting industrial control systems.
       2. For personnel completing terminations, submit data including name, employer, experience with industrial control system installations including a list of completed installations, and the names of five references for installations completed that are similar in scope to this project. Proven 3 years minimum experience is required. Submit proof of BICSI certification.
    2. Component Supply and Compatibility:
       1. Communication components shall be furnished by a single Supplier who shall have responsibility for providing complete and integrated system.
       2. Communication components and equipment shall be products of single manufacturer, when possible, and consist of equipment models that are currently in production and supported by manufacturer.
  1. SUBMITTALS
     1. General:
        1. Do not start manufacturing communication components and equipment until related submittals have been approved or accepted by Engineer.
        2. Shop Drawings and submittals shall be furnished in complete packages grouped to permit review of related items.
     2. Action Submittals: Submit the following:
        1. Shop Drawings:
           1. Drawings of proposed layout of communication network and communications, showing related equipment in relation to each other.
        2. Product Data:
           1. Manufacturer literature containing product name and model number.
           2. Manufacturer standard catalog data for materials and equipment proposed.
           3. Description of construction features.
           4. Dimensions and weights.
     3. Informational Submittals: Submit the following:
        1. Reports:
           1. Copies of the following reports shall be submitted to Engineer:

Factory Test Reports

Installation Inspection Report.

Field Testing Reports. Contractor shall have Field Testing Reports available for the Engineer during inspection.

* + - 1. Manufacturer’s Instructions:
         1. Installation and mounting details, instructions, and recommendations.
         2. Service requirements.
      2. Qualifications Statements:
         1. Provide Installer qualifications and information in accordance with this Section.
         2. Only approved installers shall perform Work on Site.

NTS: Coordinate reference sections 01 65 00, 01 66 00, 01 78 23, 01 78 39 noted following noted in 1.3 and 1.4

* + 1. Closeout Submittals: Submit the following:
       1. Operations and Maintenance Data: Furnish operation and maintenance manuals for communication components in accordance with Section 01 78 23, Operation and Maintenance Data. Operation and maintenance manuals shall include:
          1. Complete list of supplied hardware parts with model numbers referenced to system part designations, including spare parts and test equipment furnished.
          2. Copy of all approved and accepted submittals specified in this Section with revisions made to reflect actual system as tested and installed. Include half‑size black-line copies of Shop Drawings originally on paper larger than 11 inches by 17 inches.
          3. Complete, up‑to‑date documentation for system software.
          4. Manufacturer originals of hardware, software, installation, assembly and operations manuals, including:

General descriptive information covering basic features of materials and equipment furnished.

Description of layout and installation requirements and all environmental constraints.

Maintenance procedures covering checkout, troubleshooting, and servicing. Checkout procedures shall provide means to verify satisfactory operation of materials and equipment. Troubleshooting procedures shall serve as guide in determining faulty components. Servicing procedure shall cover requirements and recommended time schedule for Supplier’s recommended preventive maintenance.

Wiring and schematic diagrams.

Safety procedures and recommendations for operation and maintenance.

* + - 1. Record Documentation: Comply with Section 01 78 39, Project Record Documents, and the following:
         1. Revise all Shop Drawings, submittals, and software documentation to reflect installed conditions.
         2. Submit to Engineer the same number of revised submittals and documentation as operations and maintenance manuals required in Section 01 78 23, Operations and Maintenance Data. Updated submittals and documents will replace outdated copies of submittals and documentation in the System Operation and Maintenance Manuals. Furnish half‑size black-line drawings for all drawings larger than 11 inches by 17 inches.
         3. Submit to Engineer original CAD file \*.dwg file for all communication network connectivity with the Owner’s system.
         4. Submit to Engineer final PDF file for all communication network connectivity with the Owner’s system.
         5. Provide with record drawings submittal specific instructions regarding replacement of outdated documents.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Packing, Shipping, Handling, and Unloading
        1. Make all arrangements for transporting, delivering, and storing materials equipment in accordance with Section 01 65 00, Product Delivery Requirements, and requirements of the Supplier.
        2. Communication components equipment shall be packaged at factory prior to shipment for protection during shipment and storage. Containers shall be protected against impact, abrasion, corrosion, discoloration, and other damage. Clearly label contents of each container and information on storage conditions required.
        3. Inspect all boxes, crates, and packages upon delivery to Site and notify Engineer in writing of loss or damage to materials and equipment. Promptly remedy loss and damage to new condition in accordance with Supplier’s instructions.
     2. Storage and Protection:
        1. Store communication components equipment in accordance with Section 01 66 00, Product Storage and Handling Requirements, and Supplier instructions. Prior to shipping materials and equipment from factory, Supplier shall notify Contractor in writing of storage requirements and recommendations.

1. - PRODUCTS
   1. SYSTEM PERFORMANCE

NTS: For modification/rehab projects, verify that conditioned power source or ups exists and is being utilized by the Communication computers and computer network components being replaced before retaining paragraph “A.1”. If conditioned power source exists, delete paragraph “A.1”.

* + 1. General:
       1. All communication computers and computer network components shall be powered from conditioned power source or uninterruptible power supply (UPS) that shall provide reliable source of uninterruptible power during complete or partial interruption of incoming line power
       2. Tag all components with item number and nomencla­ture indicated on the Contract Documents.
    2. Power Supplies:
       1. All electrically-powered equipment and devices shall be suitable for operation on 115 volt ±10 percent, 60 Hertz ±2 Hz power. If different voltage or closer regulation is required, provide suitable regulator or transformer.
       2. Power supplies shall be suitable for minimum of 130 percent of maximum simultaneous current draw.
    3. Environmental Conditions:
       1. Design and construct communication computers and computer network for continuous operation under the following conditions:
          1. Control Rooms:

Ambient Temperature: 60 degrees F to 90 degrees F normal range; 40 degrees F to 105 degrees F occasional maximum extremes.

Relative Humidity: 80 percent normal; 95 percent maximum.

* + - * 1. Products located indoors but outside of control rooms:

Ambient Temperature: 40 degrees F to 120 degrees F.

Relative Humidity: 98 percent maximum.

1. - EXECUTION
   1. INSTALLATION
      1. Contractor shall install and connect communication system in accordance with Manufacturer’s written instructions and approved submittals.
   2. FIELD QUALITY CONTROL
      1. Protection during Construction.
         1. Throughout contract, the Contractor shall provide protection for materials and equipment against loss or damage and the effects of weather. Prior to installation, store items in indoor, dry locations. Provide heating in storage areas for items subject to corrosion under damp conditions. Specific storage requirements shall be in accordance with the manufacturer’s recommendations.
      2. Panels and Panel-Mounted Equipment.
         1. Enclosure and enclosure mounted devices shall be assembled as completely as possible at the factory or in a similar controlled environment. No work, other than correction of minor defects or minor transit damage, shall be done on the enclosures at the job site.
      3. Inspections.
         1. Communications provider shall provide services of qualified service engineer to supervise and inspect equipment installation to ensure system is installed in accordance with manufacturer’s recommendations.
         2. Communications provider shall supervise final power and communication connections to all equipment provided under this section. For all equipment provided under this section and all other equipment interfaced by the system, the Owner shall be involved in final connections that interface to the Owner’s communication equipment.
      4. Connections to Owner’s System
         1. Owner’s representation shall witness connections that interface to the Owner’s System.
         2. Provide a 7-day notice to the Owner prior to connections.
      5. Maintenance of Shop Drawings
         1. Contractor shall update and maintain Shop Drawing redlines daily.
         2. Maintain in control panel, or other approved location, in clean, dry, legible condition, complete sets of the Shop Drawings for use by Contractor, Engineer, Owner and others on site.
         3. Do not use Shop Drawings for purpose other than serving as Project record. Do not remove Shop Drawings from control panel, or other approved area, without Engineer’s approval.
         4. Contractor shall maintain and have on-hand the Field Testing Reports for use by Contractor, Engineer, Owner and others on site at the time of testing and for the duration of the project.

+ + END OF SECTION + +