PROJECT MANUAL

Project:

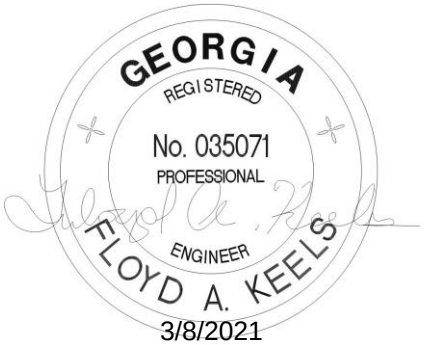
JACKSON CO DETENTION CENTER
CCTV SYSTEM UPGRADES
555 Stan Evans Drive
Jefferson, Georgia 30549

Owner:

Jackson County Board of Commissioners
5000 Jackson Parkway
Jefferson, Georgia 30549

Architect:

Next Level Engineering and Const. LLC
2891 Line Street
Austell, Georgia 30106



March 8, 2021

DOCUMENT 000110

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Not Used

END OF SECTION

SECTION 011000

SUMMARY

PART 1 - GENERAL

1.1 SECTION SUMMARY

A. Section includes the following:
1. Definitions.
2. Project information.
3. Summary of the project.
4. Use of site.
5. Specification formats and conventions.

B. This section has no force or effect on the Contract.

1.2 DEFINITIONS

A. General Definitions:
1. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
2. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
3. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
4. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
5. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
6. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
7. "Provide": Furnish and install, complete and ready for the intended use.
8. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

B. Specific Definitions to this Section: The following definitions are included in the Conditions of the Contract of which the following terms are repeated in parts here for understanding.
1. Project: “The Project is the total construction of which the Work performed under the Contract Documents …..”
2. The Work: “… means the construction and services required by the Contract Documents …”

1.3 PROJECT INFORMATION

A. Project Identification:

Jackson County Detention Center Closed Circuit TV Upgrades

Address:

B. 555 Stan Evans Drive, Jefferson, Georgia 30549

C. Owner:

Jackson County Board of Commissioners
5000 Jackson Parkway
Jefferson, Georgia 30549

1. Owner's Representative:
   Kevin Poe, County Manager
   67 Athens Street
   Jefferson, Georgia 30549
   706-367-6314
2. Notices required under this Agreement shall be sent postage prepaid, U.S. mail or hand delivered to the party at the above address.

D. Architect/Engineer:

Next Level Engineering and Construction Services, LLC
2891 Line Street
Austell, Georgia 30106
floyd@nextleveleng.net
(470) 330-0231

1. Architect/Engineer's Representative:
   Larry Latimer
   Low Voltage Systems Designer
   llatimer.rosserint@gmail.com
   404-617-5373
2. Notices required under this Agreement shall be sent postage prepaid, U.S. mail or hand delivered to the party at the above address.
3. The mailing address for the party above is as follows:
   Next Level Engineering and Construction Services, LLC
   2891 Line Street
   Austell, Georgia 30106
4. Project Document Administrator (PDA): Architect/Engineer has assigned its representative at the POC for submittals and correspondence that relate to the execution of the scope of work. Contact should be made via e-mail.

1.4 SUMMARY OF THE PROJECT

A. Project will be constructed under a single prime contract.

B. The Project, should all alternates be accepted, consists of the replacement of the existing analog CCTV system with a new IP-CCTV system in accordance with the plans and specifications.

1. The base bid includes:
   a. All labor and material to demolish and replace the existing analog CCTV system with a new IP-CCTV system.
   b. Coordination and Cooperation with the owner’s agent in the integration of the new IP-CCTV system into the existing security monitoring and control system.

2. By Alternate include:
   a. Labor and materials at Unit Price for troubleshooting and repair of existing infrastructure where may be required (See Section 12300 – Alternates)

C. The intent and meaning of the Contract Documents is that the Contractor, under the General Conditions and other terms of the Contract, shall take all actions necessary and required to provide all labor, materials, supplies, equipment, tools, machinery, utilities, transportation, facilities, services and appurtenances necessary and required for the proper construction and completion of the described Project.

1.5 USE OF SITE

A. General contractor shall have restricted use of the site for construction operations limited by owner's security control measures. The security of the existing facility shall not be compromised in any way when performing construction work, Contractor shall be responsible for coordinating and scheduling construction activities at the site with Owner's security personnel.

B. General Contractor's use of site is limited within location indicated on drawings and by Owner's right to perform work or to retain other contractors on portions of Project.

C. The Contractor will have use of the site Mondays to Fridays, exclusive of holidays recognized by Jackson County Government, from the hours of 7:30 AM to 4:30 PM.

D. Note that this is an occupied facility and security concerns of the facility staff will take precedence. Tools must be inventoried upon entering and leaving the facility. Vehicles must be locked at all times. There will be no interaction with the facility inmates at any time for any reason. Cell phones may be used only upon written approval of the owner. Contractor's staff must submit to and pass a background check.

E. Any required interruption of services must be coordinated with the owner – give 5 working days notice.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using CSI/CSC's "MasterFormat" numbering system, 2004 edition.
   1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
   2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor.
      a. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      b. The words "shall," "shall be," or "shall comply with," depending on the context, are

implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 012300

ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be deducted from the Base Bid amount if the Base Bid exceeds the amount of money budgeted for the Project.

B.

1. The value for each alternate is the net add from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.
2. Alternates, if taken, will be taken in numerical sequence to a sum which is not in excess of the amount budgeted.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project. Include as part of each alternate, the following:
1. Costs listed for each alternate include costs of related coordination, modification, or adjustment of the Base Bid Documents.
2. Miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted or rejected.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. ALTERNATE NO. 1

1. Where needed and authorized by the owner, or owner's representative, the contractor will provide troubleshooting and repair of existing infrastructure at an hourly rate and stipulated materials mark-up. Rate and Mark-up will be all inclusive – no additional charges of any kind will be allowed, specifically, but not limited to, home office expenses, engineering, programming, software, licenses, overhead, profit or field expenses. Hours for this alternate must be signed off by the owner/agency when the work is begun and completed. Copy of original invoices must be submitted for reimbursement of materials mark-up – contractor's internal department to department invoices will not satisfy this requirement. Materials will be reimbursed at cost plus mark-up percentage.

2. ALTERNATE NO. 1

a. HOURLY RATE FOR TROUBLESHOOTING AND REPAIR - $_____ per hour.

b. PERCENT MARK-UP FOR SUPPLIES AND MATERIALS - _____ %

B. ALTERNATE NO. 2

1. Provide all material and labor to add four each total, one each per location, CCTV work stations to include CPU, keyboard, mouse, point of use UPS, network connection, programming, software and one each 22" monitor per the specifications. One each CCTV work station will be provided and installed at the officer station millwork in following locations:

a. Min Security Dayroom E100
b. Min Security Dayroom F100
c. Min Security Dayroom G100
d. Min Security Dayroom H100

2. Alternate No. 2 cost will be one price for ALL FOUR work stations. The price will be all inclusive – no additional charges of any kind will be allowed, specifically, but not limited to, home office expenses, engineering, programming, software, licenses, overhead, profit or field expenses.

3. ALTERNATE NO. 2

a. COST TO ADD FOUR NEW CCTV WORKSTATIONS - $_____ Lump Sum

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END OF SECTION

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 CHANGE ORDER PROCEDURES

A. First Action: Architect prepares detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Change Order Proposals issued by Architect are for information only. It is not to be considered instructions either to stop work in progress or to execute the proposed change.
   2. Architect transmits Change Order Proposal to the owner.

B. Second Action: Upon receipt of Change Order Proposal, the owner authorizes prepares and issue of a change order proposal request.
   1. The owner authorizes the transmittal of the change order proposal request to Contractor.

C. Third Action: Within 20 days of date of Change Order proposal request, Contractor submits quotation estimating cost adjustments to the Contract Sum and Contract Time necessary to execute the change.
   1. Prepare response to Architect’s Change Order Proposal request.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      d. Comply with requirements in Division 1 Section Product Requirements if the proposed change requires substitution of one product or system for product or system specified.
   2. Failure to Respond: If Contractor fails to respond to Change Order Proposal request within stipulated time, the owner will assume no change in Contract Sum or contract Time is requested and will issue a Consent Change Order.
   3. Contractor transmits Change Order Breakdown to the architect.

D. Fourth Action: Architect reviews quantities indicated in Contractor’s Change Order Breakdown for reasonableness and accuracy.
   1. Rejection: If the Architect cannot certify Contractor’s Change Order Breakdown, then Architect returns Change Order Breakdown to Contractor with explanation for rejection.
      a. Contractor makes corrections necessary to obtain Architect’s certification and resubmits to Architect.
   2. Acceptance: Architect certifies Change Order Breakdown and transmits to owner.

E. Fifth Action: Upon receipt of certified Change Order Breakdown, owner:
   1. Accepts the architects disposition as to certification of the Change Order Breakdown.
   2. If approved, issues a formal change order to the contrator.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CHANGE ORDER PROCESSING

A. Number of Copies: Each entity produces new documents in quadruplicate.

B. Transmittal: Transmit using transmittal form as cover. Provide the following information on transmittal:
   1. Project name.
   2. Project number.
   3. Project location.
   4. Date of transmittal.
   5. Encumbrance Record number.
   6. Description of enclosures.
   7. Destination (To:). Include name, company name, delivery address and telephone number of recipient.
   8. Source (From:). Include name, delivery address and telephone number of transmitter.
   9. Signature of transmitter.

END OF SECTION

SECTION 012900

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:
1. Division 1 Section “CONTRACT MODIFICATION PROCEDURES” for administrative procedures for handling changes to the Contract.
2. Division 1 Section “CONSTRUCTION PROGRESS DOCUMENTATION” for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

A. Schedule of Values (Also referred to as "Initial Breakdown"): A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

B. Application for Payment (Also referred to as “Periodical Estimate” or “Periodical Payments"): A request from Contractor for payment of Work completed at the end of a period of construction indicated in the Agreement between Owner and Contractor

PART 2 - PRODUCTS

2.1 SCHEDULE OF VALUES

A. Format and Content: Using AIA Form G702 and CSI specification format 2004 submit a Schedule of Values to the Architect.

2.2 APPLICATIONS FOR PAYMENT

A. Format and Content: Use and include as part of each Application for Payment, the following GSFIC Forms. Sample copies included at end of this Section.
1. Periodical Estimate, AIA Form 702.
2. Schedule of Change Orders.
3. Work Performed To Date.
   a. At initial Application for Payment, use pre-approved Schedule of Values.
   b. Thereafter, update from previously approved Application for Payment.
4. Summary of Materials Stored.

PART 3 - EXECUTION

3.1 SCHEDULE OF VALUES

A. Contractor Action: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule and Submittals Schedule.
1. Submit 4 copies of the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
a. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
b. Round amounts to nearest whole dollar with total equaling Contract Sum.
2. Rejection: Make corrections as noted and return to Architect.

B. Architect’s Action: Architect will review and take action on Contractor’s Schedule of Values.
1. Acceptance: Architect will note approval and forward 1 copy each to Contractor and owner. Architect will retain 1 copy.
2. Rejection: Note cause for rejection and return to Contractor.

3.2 CONTRACTOR ACTION ON APPLICATIONS FOR PAYMENT

A. General: Make each Application for Payment consistent with previous applications and payments as certified by Architect and paid for by Owner.
1. Initial Application for Payment, Application for Payment prior to reduction in retainage and final Application for Payment involve additional requirements.
2. The date for each progress payment and the period of construction Work covered by each Application for Payment is indicated in the Agreement between Owner and Contractor.
3. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor.
4. Transmittal: Submit 4 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours.
a. Transmit using transmittal form as cover. Provide the following information on transmittal:
1) Project name.
2) Project number.
3) Project location.
4) Date of transmittal.
5) Description of enclosures.
6) Destination (To:). Include name, company name, delivery address and telephone number of recipient.
7) Source (From:). Include name, delivery address and telephone number of transmitter.
8) Signature of transmitter.
5. Rejection: Make corrections as noted and return to Architect.

B. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. Schedule of Values.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Initial progress report.
5. Report of preconstruction conference.
6. Initial settlement survey and damage report if required.

C. Final Payment Application: Submit final Application for Payment showing 100 percent completion for portion of the Work claimed as complete. Include the following:
1. Evidence of completion of Project closeout requirements.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Lien waivers.
4. Evidence that claims have been settled.

3.3 ARCHITECT'S ACTION ON APPLICATIONS FOR PAYMENT

A. Architect will review and take action on Contractor's Schedule of Values.
1. Acceptance: Architect will certify and forward 1 copy each to Contractor and owner. Architect will retain 1 copy.
2. Rejection: Note cause for rejection and return to Contractor.

END OF SECTION

SECTION 013113

PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes Contractor's administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
   1. General project coordination procedures.
   2. Coordination Drawings.
   3. Administrative and supervisory personnel.
   4. Cleaning and protection.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section FIELD ENGINEERING specifies procedures for field engineering services, including establishment of benchmarks and control points.
   2. Division 1 Section PROJECT MEETINGS for progress meetings, coordination meetings, and preinstallation conferences.
   3. Division 1 Section CONSTRUCTION PROGRESS DOCUMENTATION for preparing and submitting Contractor's Construction Schedule.
   4. Division 1 Section PRODUCT REQUIREMENTS for coordinating general requirements for delivery, storage, handling and installation of materials and equipment.
   5. Division 1 Section EXECUTION REQUIREMENTS for procedures for coordinating general installation of products and examination of existing conditions.
   6. Division 1 Section PROJECT CLOSEOUT for coordinating contract closeout.

1.3 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
   3. Make provisions to accommodate items scheduled for later installation.
   4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
   5. In addition to submittals required by each specification section, Contractor shall produce a complete set of coordinated and engineered shop drawings showing integration of all millwork, security door hardware, special equipment and mechanical equipment with electrical power, lighting controls, CCTV, locking controls, duress devices, public address, intercom, card access, fire and life safety, and television signal distribution.
      a. Coordinated shop drawings shall also include all duct, piping and conduit placement in order to avoid conflicts.

b. These coordinated drawing shall be submitted prior to any work proceeding and Contractor is entitled to no additional compensation if conflicts arise that could have been avoided through complete and coordinated shop drawings

B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination.
1. Include such items as required notices, reports, and attendance at meetings.
2. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Compliance with NPDES Rules: Insure that each secondary permittee is provided with a copy of the plan and that they understand their role in the implementation of the plan. Make every effort to establish utilities as secondary permittees. Provide participants in land disturbance activity on site a copy of the plan. Include language in all participants' contracts certifying that they understand the NPDES permit requirements and will adhere to the plan, if required by paragraph F-03 of Section F.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Startup and adjustment of systems.
8. Project closeout activities.

E. Conservation:
1. Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.
2. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
1. Show the relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
4. Comply with requirements contained in Division 1Section SUBMITTAL PROCEDURES.
5. Refer to Division 28 Section ELECTRONIC SYSTEMS GENERAL for specific coordination requirements for plumbing, mechanical, electrical and security electronics installations.
6. Failure on the part of the Contractor to properly coordinate installation of the various trades will not be considered changes to the Contract.

B. System Coordination Drawings: Prepare coordination drawings for Divisions 22, 23, 26, and 28 systems. Drawings shall be a composite drawing showing equipment, ductwork, piping, major conduit, and

supports.

1. Format: Drawings shall be prepared on electronic media. Entities responsibly for Divisions 28 shall agree on the electronic software and format to be used in preparation of the coordination drawings.
   a. Where the software allows file referencing, each system shall be laid out in separate file. Using the separate files, a composite shall be printed of all systems.
   b. Where the software does not allow file referencing, the entity responsible for Division 28 security systems respectively for addition of the layout of their systems.
2. The layout drawings shall include:
   a. Part Plans and elevations of equipment rooms showing proposed piping, ductwork, conduit, foundations, dimensions of openings in floors, roofs, and walls, and equipment to establish that the equipment will fit the allotted spaces with clearances for installation and maintenance.
   b. Floor Plans, with elevations where necessary, of all piping, conduit 2-inches (50mm) in size and larger, wireways and cable trays, air duct distribution including air inlets and outlets, and suspended equipment. Plan shall show proposed routing, mounting heights, changes in elevation, and location of components including major support elements.
   c. Plans, elevations and sections of property room showing conveyor storage system layout with locations of mechanical ductwork, piping, conduits, fire protection systems, light fixtures and other equipment to verify available space and clearances to fit all components.
3. Coordination: After the initial layout of each system, the contractor shall assemble the entities responsible for Division 28 to review the layout, determine if any conflicts exist, and determine course of action to relieve the conflict. Coordination drawings shall not be submitted to the Architect until after the coordination review and conflicts have been corrected.
4. Drawings shall be prepared at a scale of not less than 1/4” = 1’-0” (1:50), and drawings sheet size shall be 30-inches wide by 42-inches long. The drawing submittals by the Contractor shall consist of one reproducible sepia and three blue line prints. The sepia shall be Mylar, not less than 3 mils (0.08 m), single matte (on front), reverse reading, and the image shall be clear and distinct.

C. Staff Personnel’s Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site.
   1. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.
   2. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions:
   1. Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed.
   2. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Temporary Enclosures: Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining, and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High-speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION

SECTION 013119

PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
   1. Preconstruction conferences.
   2. Preinstallation conferences.
   3. Progress meetings.
   4. Coordination meetings.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section PROJECT COORDINATION for procedures for coordinating project meetings with other construction activities, including posting of information on internet website.
   2. Division 1 Section PRE-CONSTRUCTION VIDEO DOCUMENTATION for recording and inspection of existing site and facility conditions.
   3. Division 1 Section CONSTRUCTION PROGRESS DOCUMENTATION for preparing and submitting Contractor's Construction Schedule.

1.3 PRECONSTRUCTION CONFERENCE

A. The Architect will schedule a preconstruction conference before the start of construction, at a time convenient to the Owner and the Contractor, but no later than 15 days after execution of the Agreement.
   1. The conference will be held at the Project Site or another convenient location.
   2. The meeting will be conducted to review responsibilities and personnel assignments.
   3. The agenda will be prepared by the Architect.

B. Attendees: Authorized representatives of the Owner, Architect, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference.
   1. It shall be the responsibility of the Contractor to notify all subcontractors and other concerned parties of the time and place of the preconstruction conference.
   2. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: The Architect will prepare and distribute meeting agenda to all invited parties.
   1. Items of significance that could affect progress of construction shall be discussed.
   2. Other items including the following shall be reviewed:
      a. Tentative construction schedule.
      b. Critical work sequencing.
      c. Designation of responsible personnel.
      d. Procedures for processing field decisions and Change Orders.
      e. Procedures for processing Applications for Payment.
      f. Distribution of Contract Documents.
      g. Submittal of Shop Drawings, Product Data, and Samples.

h. Preparation of record documents.
i. Use of the premises.
j. Parking availability.
k. Office, work, and storage areas.
l. Equipment deliveries and priorities.
m. Safety procedures.
n. First aid.
o. Security.
p. Housekeeping.
q. Working hours.

D. Meeting Minutes: Architect will record significant discussions and agreements achieved in form of meeting minutes.
1. No later than 5 days after meeting, Architect will forward minutes of meeting to Contractor.
2. No later than 3 days after receipt of meeting minutes, distribute meeting minutes to attendees and other concerned parities not in attendance.

1.4 PROGRESS MEETINGS

A. Conduct progress meetings at the Project Site at intervals required by conditions of the contract, but not less than monthly. Notify the Owner and the Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.

B. Conduct progress meetings at bi-monthly intervals at Project site. Conduct the meeting to discuss items of significance that could affect progress of the Work, including the following:
1. As first item of meeting, review and correct or approve minutes of previous progress meeting.
2. Review progress of construction since the last meeting.
a. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule.
b. Determine how construction behind schedule will be expedited and secure commitments from parties involved to do so.
c. Discuss issues that are required to ensure that current and subsequent activities will be completed within the Contract Time.
3. Review present and future needs of each entity present.
4. As last item of meeting, discuss agenda for next meeting.

C. Attendees: Architect, Contractor’s Authority of Contract representative and Contractor’s project superintendent; each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities. Participants at the conference shall be authorized to conclude matters relating to the Work.

D. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
2. Review the present and future needs of each entity present, including the following:
a. Interface requirements.
b. Time.
c. Sequences.
d. Status of submittals.

e. Deliveries.
f. Off-site fabrication problems.
g. Access.
h. Site utilization.
i. Temporary facilities and services.
j. Hours of work.
k. Hazards and risks.
l. Housekeeping.
m. Quality and work standards.
n. Change Orders.
o. Documentation of information for payment requests.

E. Schedule Updating: Revise the Contractor's Construction Schedule after each monthly progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule no later than 3 days after each meeting to Owner and Architect. Contractor shall provide Owner and Architect a license for scheduling software.

F. Meeting Minutes: Architect will record significant discussions and agreements achieved in form of meeting minutes.
1. No later than 3 days after meeting, Architect will forward minutes of meeting to Contractor.
2. No later than 2 days after receipt of meeting minutes, distribute meeting minutes to attendees and other concerned parities not in attendance.

1.5 PREINSTALLATION CONFERENCES

A. The Contractor shall conduct a preinstallation conference at the Project Site before each construction activity that requires coordination with other construction.

B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect and the Owner of scheduled meeting dates.
1. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for the following:
a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Shop Drawings, Product Data, and quality-control samples
g. Review of mockups.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities.
q. Space and access limitations.
r. Governing regulations.
s. Safety.
t. Inspecting and testing requirements.

u. Required performance results.
v. Recording requirements.
w. Protection.

2. Record significant discussions and agreements and disagreements of each conference, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner and the Architect.
3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work in accordance with Article E-50 of GFSIC General Conditions, including the following:
   1. Preliminary Construction Schedule.
   2. Contractor's Construction Schedule.
   3. Submittals Schedule.
   4. Daily construction reports.
   5. Material location reports.
   6. Field condition reports.
   7. Special reports.

B. Related Sections include the following:
   1. Division 1 Section PAYMENT PROCEDURES for submitting the Schedule of Values.
   2. Division 1 Section PROJECT COORDINATION for submitting and distributing meeting and conference minutes.
   3. Division 1 Section PRE-CONSTRUCTION VIDEO DOCUMENTATION for recording and inspection of existing site and facility conditions.
   4. Division 1 Section SUBMITTAL PROCEDURES for submitting schedules and reports.
   5. Division 1 Section QUALITY REQUIREMENTS for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
1. Float time belongs to Owner as advised by the Architect.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Qualification Data: For scheduling consultant.

B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

C. Preliminary Construction Schedule: Submit two opaque copies.
1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.

D. Preliminary Network Diagram: Submit two opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

E. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

F. CPM Reports: Concurrent with CPM schedule, submit three copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

G. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

H. Special Reports: Submit two copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 48 hours of Architect's request.
1. The Consultant shall be a recognized specialist, acceptable to the Architect, who is expert in the critical path methods (CPM) of scheduling and reporting.
2. Upon request of the Architect and the Owner, the Contractor shall submit evidence that the proposed Consultant meets the qualifications identified above.
3. Contractor’s In-House Capabilities: The requirement to retain a Consultant may be waived if the Contractor can demonstrate to the Architect's satisfaction that:
   a. It has the computer equipment required to produce CPM network diagrams, utilizing the method specified.
   b. It employs skilled personnel who are experienced in CPM scheduling and reporting techniques.
   c. Its employees have at least 5 years experience in preparing CPM schedules for projects of similar size and complexity.
4. The Architect reserves the right to retain a scheduling consultant to assist in performing the Architect's functions under this Section and will inform the Contractor of its retention of such a consultant in writing.
   a. The Contractor will cooperate with the scheduling consultant by furnishing the consultant the information required to be furnished to the Architect according to this Section.
   b. The Contractor shall provide a copy of all submissions listed in this Section directly to the scheduling consultant.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section PROJECT COORDINATION. Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:
1. Review of procedures for submitting GFSIC Form No 183 Construction Progress Schedule as required by Article E-50 of the General Conditions.
2. Review software limitations and content and format for reports.
3. Verify availability of qualified personnel needed to develop and update schedule.
4. Discuss constraints, including work stages, area separations and interim milestones.
5. Review delivery dates for Owner-furnished products.
6. Review schedule for work of Owner's separate contracts.
7. Review time required for review of submittals and resubmittals.
8. Review requirements for tests and inspections by independent testing and inspecting agencies.
9. Review time required for completion and startup procedures.
10. Review and finalize list of construction activities to be included in schedule.
11. Review submittal requirements and procedures.
12. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary network diagram. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include number of days for startup and testing.
5. Final Completion: Indicate completion in advance of date established for Final Completion, and allow time for Architect's administrative procedures necessary for issuance of Final Certificate.
6. Punch List: Indicate time for completion of punch items.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Work by Owner: Include a separate activity for each portion of the Work performed by Owner, if required by the conditions of the Contract.
2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
4. Work Restrictions: Show the effect of the following items on the schedule:
a. Use of premises restrictions.
b. Provisions for future construction.
c. Seasonal variations.
d. Environmental control.
5. Work Stages: Indicate important stages of construction for each major portion of the Work,

including, but not limited to, the following:
a. Subcontract awards.
b. Submittals, including Architect's approval time and resubmittal time.
c. Purchases.
d. Mockups.
e. Fabrication.
f. Sample testing.
g. Deliveries.
h. Installation.
i. Tests and inspections.
j. Adjusting.
k. Curing.
l. Startup and placement into final use and operation.

6. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Permanent space enclosure.
   c. Completion of mechanical installation.
   d. Completion of electrical installation.
   e. Final Completion.
7. Other Constraints: Indicate where construction of roads, parking areas, landscape development and similar work must be sequenced or integrated with other construction activities.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, and Final Completion.

F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
1. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.
2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
3. Each activity cost shall reflect an accurate value subject to approval by Architect.
4. Total cost assigned to activities shall equal the total Contract Sum.

G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within fourteen days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
5. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Purchase of materials.
    d. Delivery.
    e. Fabrication.
    f. Utility interruptions.
    g. Installation.
    h. Work by Owner that may affect or be affected by Contractor's activities.
    i. Testing and commissioning.
2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format:
    a. Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    b. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.

8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the Schedule of Values).

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

2.5 REPORTS

A. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

B. Special Reports:
1. When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report.
a. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information.
b. Advise Owner and Architect in advance when these events are known or predictable.
2. Submit special reports directly to Architect and Owner within three days of an occurrence. Distribute copies of report to parties affected by the occurrence

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
1. In-House Option: Architect and Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

C. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 013235

PRE-CONSTRUCTION VIDEO DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes requirements for pre-construction video recording and inspection of existing conditions at site and facility.

1.3 SUBMITTALS

A. Video Recording: Submit two (2) copies of each video recording on digital video discs (DVD) with protective sleeve or case within seven (7) days of recording.
   1. Identification: On each copy, provide an applied label with the following information:
      a. Name and address of Project.
      b. Owner's project number.
      c. Name of Owner.
      d. Name of Architect.
      e. Name of Contractor.
      f. Name of videographer.
      g. Date video was recorded.
   2. Transcript: Prepared on 8-1/2-by-11-inch (215-by-280-mm) paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder.
      a. Include a cover sheet with same label information as corresponding video recording.
      b. Include name of Project and date of video recording on each page.
      c. Include description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      d. Include key plan of Project site and building with notation of vantage points marked for location and direction of video recording. Indicate elevation or story of construction. Include same label information as corresponding video recording.

1.4 PRE-CONSTRUCTION INSPECTION

A. Upon Owner's notification to proceed and prior to commencement of work on the Project, an inspection will be conducted at the site to video record Owner's existing facilities and site, including area of perimeter security fencing at location where temporary construction entrance is to be erected, to document pre-construction conditions.
   1. Contractor, Architect and Owner, including the Warden for the facility and Owner's invited maintenance personnel shall be present.
   2. Contractor shall notify Architect and other attending parties at least four days prior to time of inspection.
   3. A survey of the existing site and facility shall be conducted to document conditions present prior to Contractor's commencement of work on the Project.
      a. The site and facility shall be examined for damages, deteriorating construction, improper installation or use of materials and other conditions detrimental to operation and function of Owner's existing facility.

b. Items of particular importance and conditions of construction critical to the function of the facility shall be brought to Contractor's attention, including the condition of existing plant life, limits of work operations and other matters affected by Contractor's presence on the site.

4. Contractor shall video record inspection and submit copies to Architect as specified.

PART 2 - PRODUCTS

2.1 VIDEO MEDIA

A. Video Recording Equipment: Use digital video camcorders equipped with not less than 10x optical zoom and built-in microphone audio capabilities to record pre-construction inspection.

B. Video Recording Format: Provide copies of video on DVD-R recordable media.
1. Time length: 120 minutes.
2. Media Capacity: 4.7 gigabytes.
3. Recording Quality: Video quality shall be adequate to create photographic prints from individual frames.

PART 3 - EXECUTION

3.1 PRE-CONSTRUCTION VIDEO RECORDING

A. Recording: Display continuous running time and date. At start of each video recording, indicate weather conditions and actual temperature reading at Project site. Record reference points identifying location and orientation where video is being taken.

B. Narration: Describe scenes on video by audio narration on microphone while recording. Include description of items being viewed and concerns of Owner and Users. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
1. Confirm date and time at beginning and end of recording.
2. Begin recording with name of Project, Contractor's name, videographer's name, and Project location.

C. Preconstruction Video Inspection: Video record Project site and surrounding properties from different vantage points, as directed by Architect and Owner.
1. Show existing on-site conditions as well as conditions adjacent to Project site.
2. Show existing buildings either on or adjoining Project site to accurately record physical conditions prior to start of construction work.
3. Identify any damages or deteriorating construction existing on facility and at site in areas where construction work is to occur. Include zoom-in closeups of damaged and deteriorated areas.
4. Show condition of existing plant life and grass areas.
5. Show condition of existing perimeter security fencing at location where temporary construction entrance is to be constructed.
6. Identify any areas of concerns or where special care will be required to maintain existing conditions as instructed by Owner and User of the facility.

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections include the following:
1. Division 1 Section PAYMENT PROCEDURES for submitting Applications for Payment and the Schedule of Values.
2. Division 1 Section PROJECT COORDINATION for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 1 Section CONSTRUCTION PROGRESS DOCUMENTATION for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 1 Section QUALITY REQUIREMENTS for submitting test and inspection reports and for mockup requirements.
5. Division 1 Section PROJECT CLOSEOUT for submitting warranties.
6. Division 1 Section PROJECT RECORD DOCUMENTS for submitting Record Drawings, Record Specifications, and Record Product Data.
7. Division 1 Section OPERATION AND MAINTENANCE DATA for submitting operation and maintenance manuals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing

will not be delayed because of need to review submittals concurrently for coordination.

3. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Comply with requirements in Division 1 Section CONSTRUCTION PROGRESS DOCUMENTATION for list of submittals and time requirements for scheduled performance of related construction activities.

C. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Owner’s Project Number.
   c. Date.
   d. Name and address of Architect.
   e. Name and address of Contractor.
   f. Submittal number or other unique identifier, including revision identifier.
      1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01).
      2) Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
   g. Drawing number and detail references, as appropriate.
   h. Location(s) where product is to be installed, as appropriate.
   i. Other necessary identification.

D. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Submit two copies of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

E. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form.
1. Transmittal Form: Use AIA Document G810 or CSI Form 12.1A.
2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
3. Submit copies of transmittal to Owner and User.

F. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item. Note: Multiple submittal sections included under a single submittal section number shall be returned un-reviewed for correction.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (Project Name Initials – Specification Section . Submittal Version) (e.g., LNHS-Project 061000.01).
   b. Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner**,** containing the following information:
    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name of Contractor.
    e. Name of firm or entity that prepared submittal.
    f. Names of subcontractor, manufacturer, and supplier.
    g. Category and type of submittal.
    h. Submittal purpose and description.
    i. Specification Section number and title.
    j. Specification paragraph number or drawing designation and generic name for each of multiple items.
    k. Drawing number and detail references, as appropriate.
    l. Location(s) where product is to be installed, as appropriate.
    m. Related physical samples submitted directly.
    n. Indication of full or partial submittal.
    o. Transmittal number, numbered consecutively.
    p. Submittal and transmittal distribution record.
    q. Other necessary identification.
    r. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
    a. Project name.
    b. Number and title of appropriate Specification Section.
    c. Manufacturer name.
    d. Product name.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. For a fee payable directly to Architect, electronic copies of CAD Drawings of the Contract Drawings may be provided for Contractor's use in preparing submittals. Make arrangements for processing with Architect.

PART 2 - PRODUCTS

2.1 SUBMITTALS

A. General Submittal Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Submit electronic submittals via email as PDF electronic files to PDA@rosser.com
    a. Architect will return annotated file.
    b. Annotate and retain one copy of file as an electronic Project record document file.

2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Submit Product Data before or concurrent with Samples.
4. Submittal Method: Submit Product Data in PDF electronic file format.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data**.**
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shopwork manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Design calculations.
    j. Compliance with specified standards.
    k. Notation of coordination requirements.
    l. Notation of dimensions established by field measurement.
    m. Relationship to adjoining construction clearly indicated.
    n. Seal and signature of professional engineer if specified.
    o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
3. Submittal Method: Submit Shop Drawings in PDF electronic file format.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of appropriate Specification Section.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

b. Samples not incorporated into the Work are the property of the Owner.

4. Samples for Initial Selection:
   a. Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   b. Number of Samples: Submit three full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return One (1) submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
   a. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   b. Number of Samples: Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Type of product. Include unique identifier for each product.
   2. Number and name of room or space.
   3. Submittal Method: Submit in PDF electronic file format.

F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."

I. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

J. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Coordination."

K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

L. Certificates: A copy of each of each certificate specified shall be maintained at the job site for Architect.
   1. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

2. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
5. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

M. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Requirements."

N. Test Reports: A copy of each of each test report specified shall be maintained at the job site for Architect.
1. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
2. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
3. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
4. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
5. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

O. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include

name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

2.2 DELEGATED DESIGN

A. Performance and Design Criteria:

1. Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
2. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents.
2. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S REVIEW

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
1. "NO EXCEPTIONS TAKEN" indicates that fabrication may begin on all items.
2. "MAKE CORRECTIONS NOTED" indicates that Contractor shall make the corrections indicated on the returned submittal. This notation will permit fabrication to begin on all items subject to the corrections indicated.
3. “MAKE CORRECTIONS NOTED & RESUBMIT” indicates that contractor shall delay fabrication on items affected by the corrections, make appropriate changes and resubmit.
4. "REJECTED" indicates that the submission is unacceptable and requires resubmission. In the case of mock-up, reconstruction will be required. Contractor shall make corrections as noted and resubmit. Fabrication shall not begin on items covered by shop drawings bearing this notation.
5. "NOT REQUIRED FOR REVIEW" indicates that no submittal is required.

C. If re-submittals are necessary, they shall be made as specified above for submittals. Re-submittals shall highlight all revisions made and cover shall include the phrase "RESUBMITTAL NO. __".

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

F. The Architect's review shall not be construed as an indication that submittal is correct or suitable nor that work represented by submittal complies with the Contract Documents, except as to matters of finish, color and other aesthetic matters left to the Architect's decision by the Contract Documents

END OF SECTION

SECTION 013510

REQUEST FOR INFORMATION (RFI) PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for submitting Requests for Information.

B. Related Sections include the following:
1. Division 1 Section SUMMARY for information on Architect's personnel assigned as Project Document Administrator (PDA).
2. Division 1 Section PROJECT COORDINATION for requirements regarding posting of information on internet website.

1.3 DEFINITIONS

A. "Incomplete Request for Information" – IRFI: Any request by the Contractor that is deemed incomplete and/or vague, or is not submitted on the required form will be rejected and returned with a brief explanation to the Contractor.

B. "Non-Applicable Request": - NAR A Request for Information by the Contractor for information that in the Architect's professional opinion is readily apparent from reasonable observation of field conditions or review of the Contract Documents, or to be reasonably inferable therefrom. It will be rejected and returned with a brief explanation to the Contractor.

C. "Request for Information" - RFI: A written request by Contractor for interpretation of an item pertaining to the Contract Documents that Contractor or Owner deemed is either ambiguous or missing from the contract documents.

1.4 COORDINATION

A. Coordinate RFI responses with approved or un-submitted submittals.

B. Architect reserves the right to withhold action on a submittal requiring coordination with another RFI until all related RFI response verification is received by Project Document Administrator.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

3.1 REQUESTS FOR INTERPRETATION PROCEDURES (RFI's)

A. Procedure: If the need for interpretation of the Contract Documents is required, prepare and submit an RFI on the form specified.
1. Exercise due diligence to adequately and appropriately review the Contract Documents to determine answer to RFI prior to submitting.
2. If information is readily apparent from review of the Contract Documents, Architect will reject RFI. Architect will respond by indicating where information is located in the Contract

Documents.

3. Requests that are deemed incomplete, vague or contain numerous errors will be rejected. Architect will respond by asking for clarification.
4. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
5. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Form: Prepare RFI on "Request for Interpretation" form; a copy is included at the end of this Section. Use of other forms may be allowed if prior approval is obtained from Architect.

C. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Field dimensions and conditions, as appropriate.
2. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
3. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

D. Transmit RFI to PDA by method ensuring receipt within 24 hours. Number each RFI sequentially and date.

3.2 ARCHITECT'S INITIAL ACTION

A. Upon receipt of RFI, PDA will forward to appropriate discipline and Project Manager.

B. PDA will issue Response to Contractor by courier, US Mail, UPS, facsimile, or email, as appropriate.

END OF SECTION

Attachment: "Request for Interpretation" Form

ROSSER

REQUEST FOR INTERPRETATION

PROJECT: JACKSON COUNTY DETENTION CTR CCTV UPGRADES

ARCHITECT'S
PROJECT NO:

RFI No.: _____

DATE: _____

TO: Larry Latimer – llatimer.rosserint@gmail.com

AUTHORED BY: _____

cc: _____

_____

RFI Subject: _____

The following interpretation of the Contract Documents is requested in accordance with the General Conditions:

Drawing No.: _____ Detail No.: _____ Other Reference: _____

Specification Section No.: _____ Article No.: _____ Paragraph No.: _____

Date Response Requested By: _____

Description of Interpretation Needed:

_____

_____

_____

_____

_____

Attachments: Drawings _____ Specification _____ Other _____

Signed: _____ Printed Name _____ Date: _____

Response:

_____

_____

_____

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Attachments: Drawings _____ Specification _____ Other _____

Signed: _____ Printed Name _____ Date: _____

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SECTION 014000

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect or Owner are not limited by provisions of this Section.

C. Related Sections include the following:
1. Division 1 Section CONSTRUCTION PROGRESS DOCUMENTATION for developing a schedule of required tests and inspections.
2. Division 1 Section CUTTING AND PATCHING for repair and restoration of construction disturbed by testing and inspecting activities.
3. Divisions 2 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified

criteria.

F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to Architect and Jackson County, to establish product performance and compliance with industry standards.

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work. Refer to PROJECT RECORD DOCUMENTS section, OPERATION AND MAINTENANCE DATA section and PROJECT CLOSEOUT section for more detailed instructions.

1.5 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations.
1. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
2. Requirement for specialists shall not supersede building codes and regulations governing the Work.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an A2LA independent agency with the experience and capability to conduct testing and inspecting indicated, and with additional qualifications specified in individual Specification Sections; and where required by Architects, that is acceptable to Jackson County.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
3. A2LA: A testing agency accredited by the American Association for Laboratory Accreditation.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor and Owner. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.

2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction. Allow seven days for initial review and each re-review of each mockup.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Sections in Divisions 2 through 33.

1.6 QUALITY CONTROL

A. Architect Responsibilities: Architect will engage testing agency to perform testing and inspection for verification of compliance with Contract Documents.
1. Architect will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and description of the types of testing and inspecting they are engaged to perform.
2. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
3. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor.
4. Testing agency will notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
5. Testing agency will submit a final report of special tests and inspections prior to Architect’s Final Certificate, which includes a list of unresolved deficiencies.
6. Testing agency will retest and reinspect corrected work.

B. Contractor’s Responsibilities:
1. Contractor shall notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
3. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Provide the following:
    a. Access to the Work.
    b. Incidental labor and facilities necessary to facilitate tests and inspections.
    c. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
    d. Facilities for storage and field-curing of test samples.
    e. Preliminary design mix proposed for use for material mixes that require control by testing agency.
    f. Security and protection for samples and for testing and inspecting equipment at Project site.

C. Contractor Quality-Control Services: Engage a qualified testing agency, as documented by ASTM E 329, to perform quality-control services for the following. Do not employ the same entity engaged by Architect.
1. Preconstruction testing.
2. Special tests or inspections to verify compliance with codes, ordinances, laws regulations.
3. Submit each written report to Architect.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to

inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

E. Coordination:
1. Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
2. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.7 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by Architect, as indicated in individual Specification Sections, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and Owner.
4. Submitting a final report of special tests and inspections prior to Final Inspection, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 014200

REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Directed: A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

C. Indicated: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. No Exceptions Taken: Term where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in General and Supplementary Conditions. Refer to the SUBMITTAL PROCEDURES Section for more specific information.

E. Regulations: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. Install: Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. Provide: Furnish and install, complete and ready for the intended use.

I. Installer: The Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor, for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
   1. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
   2. Assignment of Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.
      a. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work.
      b. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

J. Project Site: Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

K. Testing Laboratories or Testing Agency: An independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests. Refer to the QUALITY REQUIREMENTS Section for more specific information and qualifications criteria.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
   1. Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity.
   2. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. No provisions of any reference standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of Owner, Contractor or Architect, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Architect, or any of Architect's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

1.5 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for the following:
   1. Construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection requirements.
   2. Additional temporary facilities and controls necessary for the proper execution of the Work.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

B. Secondary Permittee: Subcontractor, utility company or other entity that conducts construction activity on the Project site.

1.4 USE CHARGES

A. Owner's existing water, natural gas, and electric power systems are available for use without metering and without payment of use charges.
   1. Provide connections and extensions of services as required for construction operations.
   2. Testing agencies and Jackson County Government shall be permitted to use temporary services and facilities without cost.

1.5 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of the State of Georgia including, but not limited to, the following:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, fire department, and rescue squad rules.
   5. Environmental protection regulations.

B. Construction Safeguards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."

C. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

D. Tests and Inspections: Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses.
1. Do not overload facilities or permit them to interfere with progress.
2. Take necessary fire-prevention measures.
3. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

B. Perimeter Security Fencing: Maintain minimum 20 ft. clear distance from perimeter security fencing free and clear of obstructions from camera views at all times. Do not store materials or equipment or stage construction within this area.
1. Keep area along perimeter fencing clean and free of construction debris and trash.
2. Maintain grass area along interior perimeter fencing from excess growth. Cut grass at intervals not exceeding two week periods.

C. Construction Limits: Work shall be confined within construction limits indicated on Drawings. Keep construction areas free of debris and trash. Clean and police area at end of each day or work period. Maintain grass areas inside construction limits cut on a regular basis.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lumber and Plywood: Comply with requirements in Division 6 Section MISCELLANEOUS CARPENTRY.
1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sizes and thicknesses indicated.
3. For fences and vision barriers, provide minimum 3/8-inch- (9.5-mm-) thick exterior plywood.
4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch- (16-mm-) thick exterior plywood.

B. Gypsum Board: Minimum 1/2-inch (12.7 mm) thick by 48-inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.

C. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary offices, shops, and sheds.

D. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

E. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 8 feet (2.4 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts**,** with galvanized barbed-wire top strand.

F. Paint: Comply with requirements in Division 9 Section PAINTING.
1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
3. For interior walls of temporary offices, provide 2 coats interior latex-flat wall paint.

G. Water: Provide potable water approved by local health authorities.

2.2 TEMPORARY SECURITY FENCING

A. Fencing Materials: As specified in Division 11 Section SECURITY FENCES.

B. Visual Screening Fabric: Woven polypropylene or polyester fabric, not less than 78% solid mesh, 3 oz. per sq. yd. (100 g/m2) minimum, black color.

2.3 TEMPORARY FACILITIES

A. Field Offices: Provide at least 1 field offices for the Project. Provide 1 unit for Contractor's field office.
1. Provide prefabricated, weather-tight, mobile units with lockable entrances, operable windows, and serviceable finishes and lighting; heated and air conditioned; on foundations adequate for normal loading.
2. Common-Use Office: Provide of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:
   a. Furniture required for Project-site documents including 4-drawer file cabinets, plan tables, plan racks, and 6-shelf bookcase.
   b. Private office area with desk and chair.
   c. Private toilet facility with water closet, lavatory and medicine cabinet with mirror.
   d. Water cooler, coffee machine and supplies.
   e. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
   f. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.

B. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material; equipped with hand-wash station in each unit.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.
2. Store combustible materials apart from building.

D. Coordinate with owner for location of field office. If the construction duration is expected to be under 90 days and space needs are not prohibitive, the contractor may coordinate for use of space at the owner's facilities should such space be available. The owner is under no obligation to provide space for contractor's field office.

E. Contractor must be on site to receive contract materials and equipment. The owner will not receive contract materials or equipment for the contractor.

2.4 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating units shall be listed and labeled for type of fuel being consumed, by a testing agency acceptable to Jackson County, and marked for intended use.

C. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

D. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

E. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

F. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

B. Temporary Utilities: Make arrangements for and provide temporary utilities including light, power, fuel, and water needs for execution of work.
1. The Using Agency will provide a source of water; however, it shall be the responsibility of the Contractor, at his own expense, to route the water to its usage area. The Owner will provide the normal electrical supply and currently installed electrical system serving the facility for the use of the Contractor. However, the Owner provides no guarantee or warranty as to the system’s condition or capabilities. The Contractor shall assure himself that the electrical system is adequate for his requirements or supply additional temporary electrical power, at his own expense. The Contractor is not responsible for payment of any utilities.
2. Any damage to the electrical system resulting from misuse or abuse to the existing electrical system shall be repaired or replaced by the Contractor at no additional expense to the Owner.

C. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
1. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
2. Connect temporary sewers to municipal system as directed by Architect.

3. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
4. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

D. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping prior to use.

E. Sanitary Facilities: Install temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Install electric power service underground, unless overhead service must be used.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Install lighting for Project identification sign.

J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
1. Provide additional telephone lines for each facsimile machine and computer in each field office.
2. At each telephone, post a list of important telephone numbers.
   a. Police and fire departments.
   b. Ambulance service.
   c. Contractor's home office.
   d. Architect's office.
   e. Engineers' offices.
   f. Owner's office.
   g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone for use when away from field office.

K. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Final Completion. Remove before Final Completion. Personnel remaining after Final Completion will be permitted to use permanent facilities, under

conditions acceptable to Owner.

B. Temporary Roads and Staging Areas: Construct and maintain temporary roads and staging areas adequate for construction operations. Locate within construction limits indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and nontracking.
2. Reapply treatment as required to minimize dust.

C. Traffic Controls: Comply with requirements of Georgia Department of Transportation.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Temporary parking areas for construction personnel shall limited to locations as directed by Owner.

E. Dewatering Facilities and Drains: Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

F. Project Identification and Temporary Signs: Provide Project identification and other signs as specified. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
1. Construct project identification sign from specified plywood material of 4 ft. by 8 ft. size bound by 2 by 4 framing.
   a. Letter sizes, style and work shall be as directed by Architect.
   b. Indicate Name of Project, name of Owner, name of Contractor, name of Architect and his consultants. Submit layout of sign to Architect for approval.
   c. Mount sign on 4 by 4 posts projecting at least 6 ft. above ground and locate sign as directed.
2. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touchup signs so they are legible at all times.
4. Major subcontractors may display a sign on their storage shed not larger than 3 sq. ft. to facilitate job management and delivery of materials.

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of U.S. Environmental Protection Agency. Comply with Division 1 Section EXECUTION REQUIREMENTS for progress cleaning requirements.

H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

I. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

J. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 TEMPORARY SECURITY FENCING AND BARRIERS INSTALLATION:

A. The Contractor shall not breach, modify or demolish any portions of the existing security fencing system without the Owner’s prior approval and close coordination to maintain the secured perimeter while the work is being performed.

B. Construct temporary security fencing and barriers as indicated on drawings. Coordinate and sequence installation with Owner and obtain approval of completed fence installation before starting any other

work within the existing security fence perimeter.

1. Schedule and phase installation of temporary construction entrance through existing perimeter security fencing system with Owner so as not to disable or disrupt intrusion detection system on fencing. Cutting and tying-in of new construction entrance with the interior perimeter security fencing containing the intrusion detection system shall be performed within one work day of not more than an eight hour period.
2. The Owner will install the intrusion detection system on the interior perimeter security fencing upon erection of temporary construction entrance gates and fencing.
    a. Coordinate and sequence installation with Owner to maintain the integrity of perimeter security fencing system.
    b. Contractor shall be responsible for erecting all fence posts, including isolation posts, and fabric, to perimeter fencing system to incorporate temporary construction entrance into the existing perimeter security fencing system. Contractor shall also re-tension existing fence fabric to ensure proper operation of intrusion detection system upon completion of temporary construction entrance installation.

C. Where construction work requires access to other portions of Owner's existing facility, Contractor shall coordinate and schedule work with Owner so as not to compromise existing security systems.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of U.S. Environmental Protection Agency and Georgia Environmental Protection Division. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

C. Stormwater Control: Comply with Georgia Environmental Protection Division and NPDES. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

E. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

F. Barricades, Warning Signs, and Lights: Comply with requirements of Jackson County for erecting structurally adequate barricades, including warning signs and lighting.

G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
1. Provide temporary weathertight enclosure for building exterior.
2. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in hazardous fire-exposure areas and any dried-in area of the building.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of

fire ignition according to requirements of Jackson County Fire Department Services.

3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Final Completion.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Final Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil.
      a. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns.
      b. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by Jackson County.
   3. At Final Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section FINAL CLEANING.

C. Temporary Construction Fence and Entrance Removal: Remove temporary construction fencing, including construction entrance upon completion of construction.
   1. Coordinate and sequence removal of temporary construction entrance with Owner so as not to disable or disrupt intrusion detection system on fencing.
      a. Replacement of interior perimeter security fencing and tying-in of intrusion detection system shall be performed within one work day of not more than an eight hour period.
      b. Install and tension chain link fabric to perimeter security fence opening after removal of construction entrance gates.
   2. The Owner will install intrusion detection system after the Contractor has installed and tensioned fence fabric to existing interior perimeter security fencing.
   3. Restore perimeter security fencing system to same condition encountered prior to construction.

END OF SECTION

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; and special warranties.

B. Related Sections include the following:
1. Division 1 Section – SUBSTITUTIONS OF PRODUCTS DURING BIDDING for requirements of substituting products before bid opening.
2. Division 1 Section REFERENCES for applicable industry standards for products specified.
3. Division 1 Section PROJECT CLOSEOUT for submitting warranties for Contract closeout.
4. Divisions 2 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

C. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

D. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products to be installed. Include generic

names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:
   a. Specification Section number and title.
   b. Generic name used in the Contract Documents.
   c. Proprietary name, model number, and similar designations.
   d. Manufacturer's name and address.
   e. Supplier's name and address.
   f. Installer's name and address.
   g. Projected delivery date or time span of delivery period.
   h. Identification of the following items:
      1) Items that require early submittal approval for scheduled delivery date.
      2) Items that require early submittal approval for scheduled delivery date. Specification Sections that require samples to be submitted for initial selection.
      3) Items that require color selections and similar selections required by the Architect..
3. Pre-Constriction Submittal: As soon as possible after notice of award of the contract and in any event not later than three days prior to the time fixed in the contract for delivery of the executed form of agreement to the Owner, submit 4 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
4. Completed List: Within 30 days after Execution of Contract, submit 4 copies of completed product list.
5. Architect will respond in writing to Contractor within 15 days of receipt of completed product list.
   a. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action.
   b. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.

3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section PROJECT CLOSEOUT.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:
1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.

3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
6. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
7. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
8. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
    a. Standard Range (or Selection): Where Specifications include the phrase "standard range (or standard selection) of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 CONTRACTOR’S OPTION

A. Where specifications allow the Contractor to use another specified material, product, system or equipment as an option, the Contractor may choose to use the option on the condition that any additional costs, modifications, adjustments, redesign or alterations required to incorporate it into the construction of the Project are included in the Work in the Bid.
    1. Contractor shall be responsible for coordinating and incorporating the option, if taken, into the Project including all required submittals and specification provisions.
    2. Contractor waives rights to additional payment or time should specified options be chosen and incorporated into the Project.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 016350

SUBSTITUTIONS OF PRODUCTS DURING BIDDING

PART 1 - GENERAL

1.1 SUMMARY

A. Document includes administrative and procedural requirements for product substitutions before receipt of bids.

B. Substitutions are changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1.2 SUBMITTALS REQUIREMENTS FOR CONSIDERATION OF SUBSTITUTIONS

A. Substitution Requests: Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use CSI Form 01.5CA. Copy of this form is included after the end of this Document.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Coordination information, including a list of changes or modifications needed to other parts of the Work.
      b. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
      c. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      d. Samples, where applicable.
      e. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
      f. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

B. Timing: Architect will consider requests for substitution if received within the time frame indicated in the General Conditions or 14 days.

1.3 ARCHITECT’S ACTIONS

A. Architect will consider requests for substitutions when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   1. Substitution request is fully documented and properly submitted.
   2. Requested substitution is compatible with other portions of the Work.
   3. Requested substitution provides specified warranty.
   4. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   5. Samples, if requested.

B. If necessary, Architect will request additional information or documentation for evaluation.

C. Form of Acceptance: Acceptance indicated in an Addendum.

1.4 GENERAL PRODUCT REQUIREMENTS

A. Provide products that comply with the Contract Documents and that are complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

Attachment: Substitution Request (During the Bidding Phase) form

Advancement of Construction Technology

SUBSTITUTION REQUEST

(During the Bidding Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

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SECTION 017123

FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. General: This Section specifies administrative and procedural requirements for field-engineering services including, but not limited to, the following:
1. Construction layout.
2. Field engineering.
3. Property surveys
4. Damage surveys.
5. Geotechnical monitoring.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1 Section PROJECT COORDINATION for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section PROJECT RECORD DOCUMENTS for submitting Project record surveys.
3. Division 1 Section PROJECT CLOSEOUT for submitting final property survey with Project Record Documents and recording of Owner-accepted deviations from indicated lines and levels.

1.3 SUBMITTALS

A. Qualification Data: Submit for Land Surveyor indicating compliance with specified qualification requirements.

B. Certificates: Submit certificate signed by Land Surveyor, or professional engineer where applicable, certifying that location and elevation of improvements comply with Project requirements.

C. Certified Surveys: Submit two copies signed by Land Surveyor.

D. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

E. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of PROJECT RECORD DOCUMENTS and PROJECT CLOSEOUT Sections.

1.4 QUALITY ASSURANCE

A. Surveyor Qualifications: Engage a Professional Land Surveyor registered in the State where the Project is located, who is experienced in providing land-surveying services to the extent required for this Project.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the following:
1. The existence and location of mechanical and electrical systems and other construction affecting the Work.
2. The location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed.
1. Before beginning sitework, investigate and verify the following:
a. The existence and location of underground utilities and other construction affecting the Work.
b. The location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a Land Surveyor to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a surveyor's log of layout control work and other surveying work required.
1. Record deviations from required lines and levels.
a. Advise the Architect when deviations that exceed indicated or recognized tolerances are

detected.

b. Record on Project Record Drawings, deviations that are accepted and not corrected.

2. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used.

3. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

D. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by Land Surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

2. Recording: At Final Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

END OF SECTION

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SECTION 017300

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. General installation of products.
   2. Coordination of Owner-installed products.
   3. Progress cleaning.
   4. Starting and adjusting.
   5. Protection of installed construction.
   6. Correction of the Work.

B. Related Sections include the following:
   1. Division 1 Section PROJECT COORDINATION for procedures for coordinating construction activities.
   2. Division 1 Section CUTTING AND PATCHING for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
   3. Division 1 Section PROJECT CLOSEOUT for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   4. If conditions and substrates examined are not acceptable, prepare a written report listing conditions detrimental to performance of the Work, include the following:
      a. Description of the Work.
      b. List of detrimental conditions, including substrates.
      c. List of unacceptable installation tolerances.
      d. Recommended corrections.
   5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding

with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product.
   1. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication.
   2. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
   4. Maintain minimum headroom clearance complying with governing code in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Final Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels without personal protection.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange

joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction forces.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris. Keep site clean and free of clutter. Comply with requirements specified in Division 1 Section TEMPORARY FACILITIES AND CONTROLS for maintaining grass areas.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or

deterioration.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
   1. Comply with requirements in Division 1 Section CUTTING AND PATCHING.
   2. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 017329

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:
1. Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before starting work. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following**:**

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-suppression systems.
4. Mechanical systems piping and ducts.
5. Control systems.
6. Communication systems.
7. Conveying systems.
8. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
1. Water, moisture, or vapor barriers.
2. Roof membranes and flashings.
3. Metal roof panels.
4. Masonry walls.
5. Brick veneer.
6. Metal siding.
7. Equipment supports.
8. Piping, ductwork, vessels, and equipment.
9. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials.
1. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
2. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching.
1. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
2. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete or Masonry Materials: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch.

b. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION

SECTION 017423

FINAL CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for final cleaning prior to Final Inspection.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1 Section EXECUTION REQUIREMENTS specifies general cleanup and waste-removal requirements.
2. Division 1 Section PROJECT CLOSEOUT specifies general contract closeout requirements.
3. Special cleaning requirements for specific construction elements are included in appropriate Sections of Divisions 2 through 33

1.3 PROJECT CONDITIONS

A. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.
1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. Just prior to Date of Final Inspection, perform final cleaning for Architect' inspection of the Work to determine Final Completion.

B. General: Employ experienced workers or professional cleaners for final cleaning.
1. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program.
2. Comply with manufacturer's instructions for cleaning installed products, materials and equipment.

C. Complete the following cleaning operations before requesting inspection for for Final Acceptance for the

entire Project or a portion of the Project.

1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, foreign substances and any items that could be used as a weapon (such as welding rods, wire ties, rebars, bolts, screws, etc.)
2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
3. Remove petrochemical spills, stains, and other foreign deposits.
4. Remove tools, construction equipment, machinery, and surplus material from the site.
5. Remove snow and ice to provide safe access to the building.
6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
8. Broom clean concrete floors in unoccupied spaces.
9. Vacuum clean sealed concrete floors in occupied spaces.
10. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo, if required.
11. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
12. Remove labels that are not permanent labels.
13. Touch up and otherwise repair and restore marred, exposed finishes and surfaces.
    a. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    b. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
14. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
15. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
16. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
17. Clean ducts, blowers, and coils if units were operated without filters during construction.
18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.
19. Leave the Project clean and ready for occupancy.

D. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.

E. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

F. Compliances: Comply with governing regulations and safety standards for cleaning operations.
1. Remove waste materials from the site and dispose of lawfully.
2. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION

SECTION 017720

PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Operation and maintenance manual submittal.
   4. Warranties submittal.
   5. Demonstration and training procedures.

B. Related Sections
   1. Division 1 Section PROJECT RECORD DOCUMENTS for procedures and requirements for maintaining Record Drawings, Record Specifications, and Record Product Data.
   2. Division 1 Section OPERATION AND MAINTENANCE DATA for operation and maintenance manual requirements.
   3. Division 1 Section WARRANTIES for requirements and procedures for organizing and submitting warranties.
   4. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 33.

1.3 DEFINITIONS

A. False Start: Premature issue of "Notice of Readiness for Final Inspection."

B. Punch List: Listing of items requiring action by Contractor to complete requirements of the Contract Documents.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of issuance of Final Certificate, complete the following: List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Prepare and submit Project Record Documents, operation and maintenance manuals and similar final record information.
   6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner.
   a. Advise Owner's personnel of changeover in security provisions.
   b. Include itemized key schedule as described elsewhere in the Contract Documents.
8. Complete startup testing of systems. Submit test/adjust/balance records.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
10. Submit changeover information related to Owner' occupancy, use, operation, and maintenance.
11. Complete final cleaning requirements, including touchup painting.
12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
13. Submit pest-control final inspection report and warranty.
14. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit evidence of such demonstration and training.

B. Request for Inspection: Submit a written request, entitled "Notice of Readiness for Final Inspection." In written request, include statement as described elsewhere in the Contract Documents.

C. Inspection: On receipt of request, Architect and Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Final Certificate after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Reimbursement For False Start: Refer to General Conditions for Contractor responsibility for False Start.
   3. Results of completed inspection will form the basis of requirements for Final Completion.

1.5 ISSUANCE OF FINAL CERTIFICATE

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit certified copy of completed or corrected punch list, endorsed and dated by Architect. On certified punch list copy, state that each item has been completed or otherwise resolved for acceptance.
   2. Submit a final Application for Payment according to the General Conditions of the Contract.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit four (4) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A. Copy of this form is included after the end of this Section.

1.7 CLOSEOUT SUBMITTALS

A. Warranties: Compile and submit warranty documents as specified in WARRANTIES Section. Secure Architect's review and acceptance of documents prior to submittal.

B. Certifications, Permits, and Licenses: Submit copies of permits, licenses, and certificates as specified in QUALITY REQUIREMENTS Section. Include certifications from local governmental agencies that building has been inspected as required by laws or ordinances, and that building is acceptable to the governing authorities and approved for occupancy.

C. Project Record Documents: Submit record drawings and specifications, product data submittals, record samples and other miscellaneous records as specified in PROJECT RECORD DOCUMENTS Section. Secure Architect's review and acceptance of documents prior to submittal.

D. Operation and Maintenance Data: Submit organized and assembled operations and maintenance documents bound into manuals as specified in OPERATION AND MAINTENANCE DATA Section. Secure Architect's review and acceptance of bound manuals prior to submittal.

E. Materials and Services Lists: Submit list of subcontractors and suppliers who provided materials, equipment or services for the project.
1. Indicate company names, addresses, phone numbers and person to contact in case of problems or for information concerning the installation of products, equipment or services performed.
2. List shall be typed in a legible and organized format.

F. Manufacturers Certificates: Submit manufacturers' certificates for major components in accord with requirements of the General Conditions.
1. Assemble manufacturers certificates with required accompanying documents.
2. Provide two copies. Organize manufacturers certificates and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents. Identify each binder on front and spine with the printed title "MANUFACTURERS CERTIFICATES," Project name, and subject matter of contents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel on how to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Provide instructors experienced in operation and maintenance procedures. Have factory-authorized service representative give instructions if indicated within an individual Specification Sections.
2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with Owner, through Architect, with at least 15 days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
1. System design and operational philosophy.
2. Review of documentation.
3. Operations.
4. Adjustments.
5. Troubleshooting.
6. Maintenance.
7. Repair.

END OF SECTION

Attachment: CSI Form 14.1A "PUNCH LIST"

Advancement of Construction Technology

PUNCH LIST

Project: _____

_____

To (Contractor): _____

_____

From (A/E): _____

Site Visit Date: _____

A/E Project Number: _____

Contract For: _____

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Item Number	Room Number	Location (Area)	Description	Correction/Completion Date	Verification A/E Check

☐ Attachments

Signed by: Date:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

September 1996
CSI Form 14.1A

SECTION 017823

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials and finishes, systems and equipment.

B. Related Sections include the following:
1. Division 1 Section PROJECT CLOSEOUT for submitting operation and maintenance manuals.
2. Division 1 Section PROJECT RECORD DOCUMENTS for preparing Record Drawings for operation and maintenance manuals.
3. Divisions 2 through 33 Sections for specific operation and maintenance manual requirements for products in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS

A. Initial Submittal: Submit two (2) draft copies of each manual at least 15 days before requesting Final Inspection. Include a complete operation and maintenance directory. Architect will return one (1) copy of draft and marked whether general scope and content of manual are acceptable.

B. Final Submittal: Submit one (1) copy of each manual in final form at least 15 days prior to demonstration and training session with Owner's designated personnel. Architect will return copy with comments within 15 days after receipt.
1. Correct or modify each manual to comply with Architect's comments.
2. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

B. Demonstration and Training: Schedule demonstration and training of Owner's designated personnel for the use, operation, care and maintenance of installed materials and equipment prior to Final Inspection. Coordinate demonstration and training with initial submittal of operations and maintenance manuals and requirements specified in Division 1 Section PROJECT CLOSEOUT.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:
1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (115-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of

equipment or system.

b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (115-by-280-mm), 20-lb/sq. ft. (75-g/sq. m) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
   1. Fire.
   2. Flood.
   3. Gas leak.
   4. Water leak.
   5. Power failure.
   6. Water outage.
   7. Security systems.
   8. Locking control systems.
   9. System, subsystem, or equipment failure.
   10. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
   1. Instructions on stopping.
   2. Shutdown instructions for each type of emergency.
   3. Operating instructions for conditions outside normal operating limits.
   4. Required sequences for electric or electronic systems.
   5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   1. System, subsystem, and equipment descriptions.
   2. Performance and design criteria if Contractor is delegated design responsibility.

3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:
1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.

3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
2. Indicate contact person or entity, including phone numbers and addresses as applicable, for notification of warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.
   2. Indicate contact person or entity, including phone numbers and addresses as applicable, for notification of warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
   1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
   1. Do not use original Project Record Documents as part of operation and maintenance manuals.
   2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

G. Comply with Division 1 Section PROJECT CLOSEOUT requirements for submitting operation and maintenance documentation.

END OF SECTION

SECTION 017836

WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1 Section PROJECT CLOSEOUT specifies contract closeout procedures.
2. Division 1 Section OPERATION AND MAINTENANCE DATA for requirements for including warranties in maintenance manuals.
3. Divisions 2 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

C. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

D. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

F. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

A. Submit written warranties to the Architect for review prior to giving Notice of Readiness for Final Inspection.
1. If the Architect's Final Certificate designates a commencement date for warranties other than the date of the Final Certificate of the Architect for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
2. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.
1. Prepare written document utilizing an appropriate form, ready for execution by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Submit a draft to the Owner, through the Architect, for approval prior to final execution.
2. Refer to Divisions 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Compile two (2) copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer for submittal with contract closeout documents.
1. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
2. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
    a. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
    b. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.
3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF WARRANTIES

A. Schedule: The list indicated is not all inclusive of the warranties required for the Project and is provided as a guide for compiling the documents required for submittal. Provide warranties on products and installations as specified in the following Sections:
   1. Exterior Sealants: Section 079200 JOINT SEALANTS.
   2. Glass: Section 088000 - GLAZING.
   3. Security Glazing Materials: Section 111920 - SECURITY GLAZING.
   4. Security Door Closers: Section 111940 - SECURITY HARDWARE.
   5. HVAC Equipment: Division 23 – HEATING, VENTILATING AND AIR CONDITIONING sections.
   6. Security, Communication and Alarm Systems: Division 28 – ELECTRONIC SAFETY AND SECURITY AND COMMUNICATIONS sections.

END OF SECTION

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SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents.

B. Project Record Documents required include the following:
1. Marked-up copies of Contract Drawings.
2. Marked-up copies of Shop Drawings.
3. Marked-up copies of Specifications, addenda, and Change Orders.
4. Marked-up Product Data submittals.
5. Record Samples.
6. Field records for variable and concealed conditions.
7. Record information on Work that is recorded only schematically.

C. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1 Section PROJECT CLOSEOUT specifies general closeout requirements.
2. Divisions 2 through 33 Sections for specifying Project Record Document requirements for specific pieces of equipment or building operating systems.

1.3 RECORD DRAWINGS

A. Markup Procedure: During construction, maintain a set of blue- or black-line white prints of Contract Drawings and Shop Drawings for Project Record Document purposes.
1. Mark these Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:
a. Dimensional changes to the Drawings.
b. Revisions to details shown on the Drawings.
c. Depths of foundations below the first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by change order or Construction Change Directive.
k. Changes made following the Architect's written orders.
l. Details not on original Contract Drawings.
2. Mark record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
3. Mark record sets with red erasable colored pencil. Use other colors to distinguish between

changes for different categories of the Work at the same location.

4. Mark important additional information that was either shown schematically or omitted from original Drawings.
5. Note Construction Change Directive numbers, alternate numbers, change-order numbers, and similar identification.

B. Responsibility for Markup: The individual or entity who obtained record data, whether the individual or entity is the Installer, subcontractor, or similar entity, shall prepare the markup on record drawings.
1. Accurately record information in an understandable drawing technique.
2. Record data as soon as possible after obtaining it. Record and check the markup prior to enclosing concealed installations.
3. At time of giving Notice of Readiness for Final Inspection, submit record drawings to the Architect for the Owner's records. Organize into sets and bind and label sets for the Owner's continued use.

C. Copies and Distribution: After completing the preparation of record drawings, print two additional copies of each drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets.
1. Organize and bind original marked-up set of prints that were maintained during the construction period and the copies of the set.
   a. Bind sets with durable-paper cover sheets.
   b. Include appropriate identification, including titles, dates, and other information on the cover sheets.
2. Submit the marked-up record set and the two additional copies of the set to the Architect for the Owner's records; the Architect will retain 1 copy of the set.
3. Submit drawings at contract closeout.

1.4 RECORD SPECIFICATIONS

A. During the construction period, maintain 3 copies of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.
1. Mark the Specifications to indicate the actual installation where the installation varies from that indicated in Specifications and modifications issued.
   a. Note related project record drawing information, where applicable.
   b. Give particular attention to substitutions, selection of product options, and information on concealed installations that would be difficult to identify or measure and record later.
2. In each Specification Section where products, materials, or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
3. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made and to document coordination with record Product Data submittals and maintenance manuals.

B. Upon completion of markup, submit record Specifications to the Architect for the Owner's records.

1.5 RECORD PRODUCT DATA

A. During the construction period, maintain one copy of each Product Data submittal for Project Record Document purposes.
1. Mark Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Product Data submitted. Include significant changes in the product delivered to the site and changes in manufacturer's instructions and recommendations for installation.
2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
3. Note related Change Orders and markup of record Drawings, where applicable.
4. Upon completion of markup, submit a complete set of record Product Data to the Architect for the

Owner's records.

5. Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.

1.6 RECORD SAMPLE SUBMITTAL

A. Immediately prior to date of Final Inspection meet with the Architect and the Owner's personnel at the site to determine which of the Samples maintained during the construction period shall be transmitted to the Owner for record purposes.
   1. Comply with the Architect's instructions for packaging, identification marking, and delivery to the Owner's Sample storage space.
   2. Dispose of other Samples in a manner specified for disposing surplus and waste materials.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Immediately prior to Final Inspection, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Architect for the Owner's records.
   1. Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities.
   2. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
      a. Field records on excavations and foundations.
      b. Field records on underground construction and similar work.
      c. Survey showing locations and elevations of underground lines.
      d. Invert elevations of drainage piping.
      e. Surveys establishing building lines and levels.
      f. Authorized measurements utilizing unit prices or allowances.
      g. Records of plant treatment.
      h. Ambient and substrate condition tests.
      i. Certifications received in lieu of labels on bulk products.
      j. Batch mixing and bulk delivery records.
      k. Testing and qualification of tradesmen.
      l. Documented qualification of installation firms.
      m. Load and performance testing.
      n. Inspections and certifications by governing authorities.
      o. Leakage and water-penetration tests.
      p. Fire-resistance and flame-spread test results.
      q. Final inspection and correction procedures.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project. Recording changes and modifications to the documents shall be a condition of payment and will be verified by Architect upon submission of pay requests.

B. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction.
   1. Do not use Project Record Documents for construction purposes.

2. Maintain record documents in good order and in a clean, dry, legible condition.
3. Protect record documents from deterioration and loss in a secure, fire-resistant location.
4. Make documents and Samples available for the Architect's inspections. Provide access to record documents for the Architect's reference during normal working hours.

END OF SECTION

SECTION 28 0000 - INTEGRATED SECURITY SYSTEMS GENERAL

PART 1 - GENERAL

1.1 SCOPE

A. The scope of this contract is to replace the existing analog Closed Circuit Television System in the Jackson County Detention Center with an IP Based Digital Closed Circuit TV system, to move certain cameras and to add certain cameras in accordance with the plans and specifications.

1. Refer to Sections 011000 Summary and 012300 Alternates for specific project scope.

B. This project requires pre-qualification of Systems Integrators – see Section 1.5 of this specification.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

B. The Division 28 series of specifications describe systems that are integrated and or connected together to provide coordinated operations; therefore, individual sections do not stand alone. The installation and operation of any given system may be determined only by review of the total series of Division 28 specifications, as well as other referenced specifications.

C. Related Work specified elsewhere:
1. Site Utilities
2. Concrete
3. Painting
4. Security Hardware
5. Builders Hardware
6. Mechanical

1.3 SUMMARY

A. The Division 28 series of specifications covers the complete security, communication and alarm systems as indicated on the drawings and specified herein. The Division 28 work establishes three separate local area networks not related to the facility administration network. One network services the Security Control and Monitoring system, a second services the IP based Video Surveillance (Closed Circuit TV) system and a third services the Video Visitation system. The systems form the basis of a digital security system integrated as indicated here and in the rest of the Division 28 specifications.

B. Provide all labor materials, equipment and supervision to install specified systems and systems indicated on the plans which include, but are not limited to, the following:
1. Security Monitoring and Control System
2. Closed Circuit Television System
3. Passive Duress System
4. Television Signal Distribution Systems
5. Fire Alarm System
6. Telephone / Data Premises Distribution Systems
7. Inmate Kiosk Data Premises Distribution Systems
8. Inmate Telephone control, conduit and wiring system
9. Video Visitation Systems

10. Intercommunications System (Alternate 1)
11. Public Address and Monitoring System (Alternate 1)
12. Radio booster signal distribution conduit system
13. Raceway / Conduit System
14. Underground Duct Bank, refer to Division 26 and 28 for requirements
15. System Wiring
16. UPS Systems
17. System specific Surge Protection Equipment

C. It is a requirement of these specifications that the Division 28 systems be provided and installed by an electronic security Contractor (hereinafter referred to as Systems Integrator or "SI") whose normal business is the provision and installation of electronic security systems and equipment.
   1. Systems Integrator shall have been installing systems of similar size and scope for not less than five (5) years.

1.4 QUALITY ASSURANCE

A. All work specified under this division of the specifications shall be in accordance with the following codes and agencies:
   1. The National Electrical Code (NFPA 70) Latest Edition
   2. National Fire Protection Association (NFPA 72) Latest Edition
   3. National Fire Protection Association (NFPA 101) Latest Edition
   4. ANSI EIA/TIA Standards

B. The equipment furnished under Division 28 of the specifications shall be the standard product of manufacturers who have been supplying equipment similar to that specified for a period of not less than five (5) years, custom products shall not be acceptable.

C. The SI shall provide a full-time superintendent dedicated to the project on site to supervise the work. The superintendent shall have the following qualifications:
   1. Experienced in the application engineering, installation, and supervision of similar construction projects, both in scope and systems types, for a minimum of five (5) years.
   2. Full time employee of the SI.
   3. Have a working knowledge of all systems installed under Division 28.

1.5 ACCEPTABLE SYSTEMS INTEGRATOR (SI)

A. The intent of these specifications is to ensure the systems described in Division 28 are provided and installed by a technically experienced SI and further that the Division 28 work is fully coordinated between the various systems by a single installer who is technically qualified as described herein.

B. The following SI's are approved Systems Integrators for the services specified in Division 28:
   1.
   2.
   3.
   4.

C. Systems Integrators must submit their proposal for consideration for owner approval no later than 10 days prior to the bid date. Approved systems integrators will be named by addendum. The proposal shall demonstrate compliance with the requirements of paragraph 1.5 .D. below.

D. It is a requirement of these contract documents that System Integrators interested in bidding this project be pre-qualified by the Owner prior to bidding the project.

1. SI firms shall request approval and shall submit the following qualification data to the Architect/Engineer in writing no later than ten (10) days prior to bid date and, if approved, shall be acknowledged by Addendum prior to bid date. Verbal approval will not satisfy this requirement. All SI's shall submit a completed AIA 305 form and all additional information herein requested or will not be allowed to bid. Grounds for disqualification shall exist if in the opinion of the Architect/Engineer, the information submitted is inaccurate or, does not satisfy the qualification requirements.
2. Where the installer is a branch office or other division of a larger organization, the qualifications of the branch office or other division shall meet the requirements of Contract Documents
3. List at least five (5) correctional facility installations of IP based closed circuit TV system integrated into PLC based security monitoring and control systems similar to the requirements of this project furnished and installed by this firm. The minimum period of operation for each of the five facilities is 36 months. This experience is mandatory.
    a. For each facility: List name and location of installation, date of occupancy by Owner, and Owner's representative to contact and telephone number. Construction Manager or General Contractor, and Architect.

E. The Owner reserves the right to disqualify manufacturers, equipment suppliers, and installers who do not comply with the requirements of paragraph 1.5 D. of this section of the specifications. The intent of these specifications is to insure the systems described in Division 28 are provided and installed by a technically experienced installer and further that the Division 28 work is fully coordinated between the various systems by a single installer who is technically qualified as described herein.

F. Approval of a firm as an SI does not relieve that SI firm from furnishing all materials from manufacturers as herein specified.

G. The responsibilities of the SI include but are not limited to:
1. Submittals on all Division 28 systems and equipment.
2. Provisions, supervision, and installation of all Division 28 systems and equipment.
3. Coordination between Division 28 systems and equipment, and coordination with other trades.
4. Conduit, raceways, cable trays and wire for all Division 28 systems and equipment.
5. Conduit systems for all Division 28 empty raceway systems (and where specified, wiring)
6. Wiring termination for all Division 28 systems and equipment.
7. Power and environmental conditioning for all Division 28 systems and equipment for protection of equipment during construction.
8. Testing and check-out of all Division 28 systems and equipment.
9. Training of Owner's personnel for all Division 28 systems and equipment.
10. Warranty for all Division 28 systems and equipment.

H. Portions of the Division 28 work may be provided by other divisions and shall be limited to the following:
1. The power raceways and wiring between circuit breaker panels and equipment, (including connections to the circuit breaker but not including the actual connections to direct connect equipment), may be performed by other divisions. Receptacle types shall be coordinated with Division 28 equipment requirements. The wire for power wiring above may be supplied by the installing electrical Contractor.
2. The Division 28 raceway may be provided and installed by other divisions provided the raceway requirements are fully coordinated with the Systems Integrator to insure all raceway necessary for functional systems are provided.
3. Low voltage (less than 120 VAC), and signal wiring may be installed in raceway systems by other divisions, however, the Systems Integrator shall supply all wiring, make all terminations and check-out all wiring.

4. Wiring between hardware and control devices may be supplied and installed by other divisions, however, the size, quantity, type, and color shall be coordinated with the Systems Integrator. The systems integrator shall make all terminations.
5. All work optioned out to other divisions is the sole responsibility of the Systems Integrator for this project.
6. All branch power circuits for equipment specified within this division of work shall be on the Emergency Power System and on the UPS system (where specified). All associated wiring, conduit system, and connection for branch circuitry shall be provided and installed by Division 28 (see Division 26 panel board schedule for circuits).
7. All power connections to Division 28 equipment and devices shall be part of the Systems Integrator's work.

1.6 DRAWINGS

A. The drawings indicate the arrangement of security and communication equipment. Review architectural drawings for reflected ceiling plans, door swings, cabinets, counters and built-in equipment; conditions indicated on architectural drawings shall govern for this work. Coordinate installation of equipment with the structural, mechanical, and electrical equipment and access thereto. Coordinate installation of recessed equipment with concealed ductwork and piping, and wall thickness.

B. Do not scale security drawings. Device locations are approximate. Actual device locations shall be field coordinated with all other trades and applicable code requirements.

C. All raceways required for Division 28 equipment are not shown on the drawings. Raceways that are shown are minimum sizes and quantities. The SI shall provide all additional quantities, routing, and sizes of raceways and pull/junction boxes to meet all code, plan, and specification requirements.

D. Raceway home runs as shown on the Division 28 drawings shall be installed as shown on the drawings.

1.7 SUBMITTALS

A. Shop Drawings
1. The Integrated Security Systems installation shall be approved by the appropriate fire and building inspection authority prior to installation, after installation and prior to final inspection or initial use. Vendor submittals including shop drawings describing all Integrated Security Systems shall be provided for review and approval to those authorities prior to submission and installation and as-built drawings shall be provided prior to occupancy.
2. Submit for review by the Architect complete engineering data for each system for evaluation of the proposed system with respect to specification requirements. Submittals for each system shall consist of:
   a. Certifications required elsewhere in these specifications
   b. Equipment cut sheets (manufacturer's catalog sheets)
      1) Clearly mark each item to indicate its use in the overall project by specification section or reference to specific components shown on contract or shop drawings.
      2) Cut sheets indicating multiple models shall be clearly marked as to which model(s) will be supplied for this project.
      3) Where options are described, mark out all options that do not apply to this project.
   c. Block diagrams, specific for this project, of each system indicating:
      1) Location of components
      2) Point to point wiring diagrams

3) Interconnections between systems
4) Nature of interconnections including:
a) Signal type
b) Signal purpose
c) Wire or fiber type
d) Conduit size if contained in conduit

d. Layout drawings of equipment
1) Scaled and dimensioned placement in the facility on large scale floor plans including but not limited to:
.1 Equipment rooms
.2 Control rooms
2) Scaled and dimensioned placement of equipment in the rack or cabinet including overall dimensions.
3) Detail wiring diagrams of equipment racks and cabinets indicating wire sizes and types, terminations and interconnecting cabling.
4) Other drawings necessary to demonstrate contract conformance

e. Operational Narrative
1) Step-by-step operational sequences for each individual control function.

f. Calculations
1) Provide calculations used for UPS selection.
2) Provide calculations for Fire Alarm secondary power supply.
3) Provide calculations for video storage in various sections
4) Provide other calculations as specified.

g. Paint Colors
1) Submit paint chips for the colors of all paint used to identify conduit and boxes on this project. Submit samples of the paint chips for the fire alarm, telephone, data, television, paging, emergency and security systems.

h. Equipment/System Identification
1) Submit individual samples of the engraved plastic/laminate signs for the fire alarm, telephone, data, television, paging, emergency and security systems.
2) See individual specifications for additional system specific requirements

i. Wire and Cable Identification Labels
1) Submit sample labels with text applied.

3. The shop drawing shall be submitted at the same time.
a. Shop drawings shall be submitted in no more than two formats as follows:
b. 8-1/2 x 11 inch format
1) Bind in three ring binders no larger than three inches containing not more than 2 inches of materials. Smaller binders shall not be filled beyond the ratio for three inch binders.
2) Divide contents by specification section or system and label with tab dividers.
3) If submittal items do not fit one 3 inch binder, provide multiple binders. Do not split a tabbed section between two binders.
4) The cover of binders shall indicate the following:
a) Project name
b) Date submitted
c) Company name of the submitter
d) Submittal number
e) Index

c. Plans no larger than the contract document plan size
1) Bind in sets no larger than one inch thick.
2) Plan sheets shall be numbered or lettered uniquely from each other and bound in logical sequence.
3) If necessary, provided multiple bound sets.
4) The cover of each set shall indicate the following:
a) Project name
b) Date submitted

c) Company name of the submitter
d) Submittal number
e) Index

d. Prior to submitting shop drawings, the Systems Integrator shall review the submittal for compliance with the Contract Documents and place a stamp or other confirmation thereon which states that the submittal complies with Contract requirements. Submittals without such verification will be returned disapproved without review. Any re-submittals required shall be labeled "RE-SUBMITTAL" and the number given.

e. Pre-Shop Drawing Preparation Meeting:
1) Not later than 30 days after the Notice to Proceed, a pre-shop drawing preparation meeting shall be held at the office of the Architect. The purpose of the meeting shall be to establish the following as defined by the contract documents for Division 28.
a) Manufacturer's qualifications are met.
b) Proposed methods and materials are as defined.
c) The Division 28 superintendent has an understanding of required system and security hardware configuration and operation, and shall explain in detail the operation of all systems.
d) Shop drawing submittal requirements.
2) The above shall serve as the agenda for the meeting and the necessary information shall be presented by the Division 28 superintendent.
3) As a minimum requirement, the Division 28 Superintendent shall address each specified system under Division 28, including the proposed material, operation and all interfaces to the other systems and divisions.
4) It is anticipated that this meeting will take two working days to complete; however, the Systems Integrator shall be prepared to spend additional time as necessary to complete the stated objectives.
5) Systems Integrator’s questions will be taken by the Architect.
6) The Systems Integrator costs for this meeting shall be borne by the Systems Integrator.
7) The Architect shall determine if the objectives of the meeting were met. The cost of any delays and all other costs incurred by required subsequent meetings to satisfy the stated objectives shall be borne solely by the Systems Integrator.

f. When the Systems Integrator has completed the design work on the various systems and is prepared to submit the shop drawings, the Systems Integrator shall set up a meeting with the Architect to present the shop drawings. The meeting must take place no later than 60 days after Pre-Shop Drawing Preparation Meeting. The Systems Integrator shall explain the entire system operation, equipment and other items as called for in this specification. Any drawings required will be preliminarily reviewed at this meeting. Any corrections required from the meeting shall be made by the SI and submitted for approval. This meeting shall be held in the offices of the design team in Atlanta, Georgia.

1.8 RECORD DOCUMENTS

A. Fourteen days prior to final inspection, the SI shall submit three sets of record documents. Record documents shall include but not be limited to the following:
1. Copies of approved shop drawings modified as follows:
a. Covers shall indicate that the submittal is part of record documents as described below.
b. The shop drawings shall be modified to indicate as-built conditions and each change shall be clouded or otherwise noted.
2. Manufacturer’s Operational and Maintenance manuals for each system:

a. Mark out all subjects or portions of the manuals that do not apply to the systems installed for this project.

3. Conduit riser diagrams for all systems indicating the following:
   a. Individual runs of conduit between equipment rooms
   b. Individual runs of conduit between equipment rooms and control posts
   c. Individual runs of conduit between other major system components
   d. Where junction boxes, pull boxes, man holes, or other intermediate location exists between the points above, indicate their type size and location.
   e. Each individual run of conduit shall be marked with the following:
      1) Size of conduit(s)
      2) Purpose of conduit(s)
      3) Type and size of wire(s), cable(s), and / or fiber.
4. Conduit layout diagrams including
   a. Source equipment
   b. Destination equipment
   c. All raceway components and their location in the building
   d. Each individual run of conduit shall be keyed to the riser diagrams or be marked with the following:
      1) Size of conduit(s)
      2) Purpose of conduit(s)
      3) Type and size of wire(s), cables(s), and / or fiber.

B. Record documents shall be bound as required for shop drawings except they shall be marked as record documents with appropriate dates and submittal numbers.

C. All record documents for systems installed on this project shall be submitted at the same time.

D. Certification from system manufacturers that systems are installed in accordance with manufacturer's recommendations and are functioning correctly at the time of final inspection.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials or equipment specified by manufacturer's name shall be provided, unless approval of other manufacturers is listed in addendum to these specifications. Any materials or equipment approved in addendum shall function the same as the equipment specified.

B. Where substitution of materials alters space requirements indicated on the drawings, submit shop drawings indicating proposed layout of space, all equipment to be installed therein and clearances between equipment. All cost for space requirements shall be borne by the Systems Integrator including all cost to the Architect.

C. Where substitution of materials alters electrical requirements indicated on the drawing, the contractor shall coordinate with Division 26 and bear the costs associated with the substitution.

D. All material shall be new and shall conform to the applicable standard or standards where such have been established for the particular material in question. Publications and standards of the organizations listed below are applicable to those materials specified herein:
   1. American Society for Testing and Materials (ASTM)
   2. Underwriters Laboratories (UL)
   3. National Electrical Manufacturer Association (NEMA)
   4. Institute of Electrical and Electronic Engineers (IEEE)
   5. National Fire Protection Association (NFPA)
   6. American National Standards Institute (ANSI)

E. UL listed material shall bear UL label.

F. All like materials shall be of the same manufacturer.

G. All materials and connections shall be installed in strict accordance with all applicable codes, UL standard and manufacturer's written requirements including torque requirements for terminal connections.

H. The Architect reserves the right to require a sample of equipment submitted for approval or to require a demonstration of any specific system.

2.2 SOFTWARE

A. All software for this project that requires licensing shall be licensed in the name of the Owner and proof of licensing shall be turned over to the Owner at Substantial Completion as well as the original install media, manuals, and copies of the modified software. All software licenses shall be included and they shall be perpetual (shall not require annual subscriptions or renewals).

B. All software shall be installed on the maintenance laptop computer fully functional. Provide all cables/connectors to connect the laptop to all systems. See Section 284619.

C. Software shall be installed in all spare equipment to be turned over to the Owner for all systems.

PART 3 - EXECUTION

3.1 TESTING

A. General
1. The Systems Integrator shall fully test and correct errors in the installed systems prior to calling for testing to be witnessed and directed by the Architect and / or Owner, hereafter referred to as “performance testing”.
2. The SI shall provide the following during performance and progress tests.
   a. The project superintendent
   b. Sufficient other personnel to:
      1) Operate equipment
      2) Manipulate devices
      3) Provide access to equipment and spaces
   c. Keys to equipment and spaces
   d. Tools
      1) Security tools for security fasteners
      2) Test equipment to test specified performance levels of the equipment
      3) Other tools as necessary for access and adjustments
   e. Portable radios or other communications devices sufficient to communicate between any locations in the facility.
3. All costs incurred by the SI for testing shall be included in the Base Bid.

B. Progress Testing
1. Progress testing will be performed to determine the progress of the work and contract compliance.
2. Progress testing shall be performed at the following times
   a. As determined by the Architect
3. Progress testing will consist of but is not limited to the following:
   a. Review of materials in place and in storage for the purpose of determining:
      1) Progress of the work
      2) Approved materials
      3) Approved installation

4) Approved storage methods

b. Operational tests will be performed on the work in place consistent with Performance Testing except as follows:
   1) Manufacturer's certification is not required
   2) SI testing prior to the progress testing however the Superintendent will brief the reviewer as to the portions of the system(s) that have been tested and are considered ready for performance testing.

C. Performance Testing
1. Performance testing shall be performed to verify that all Division 28 work has been accomplished and that it is in compliance with the contract documents.
2. Performance testing shall occur:
   a. Prior to substantial completion of the project
   b. After the SI certifies in writing to the Owner that all work has been completed in accordance with the contract documents and has been tested and found operationally in compliance with the contract documents.
   c. After the various manufacturer's technical representatives has certified in writing to the Owner that the systems are:
      1) Installed in compliance with the manufacturer's recommendations
      2) In compliance with the requirements of the contract documents
      3) Operating in compliance with the contract documents
3. The performance testing shall consist of testing to determine the proper installation and operation of the following:
   a. Each device that is monitored or controlled
   b. Each control device
   c. Circuit supervision and enunciation of system faults
   d. Simultaneous control, monitoring, and alarm events
   e. Integration between systems
   f. Connections to other systems
   g. Annunciation
   h. Messaging
   i. Printing
   j. Logging
   k. Displays

3.2 TRAINING

A. Training shall be scheduled by the SI with the Owner/User.

B. The SI shall include in the base contract all costs required to train the Owner's operating and maintenance personnel in the use and maintenance of systems provided under this division of the specifications. Training sessions shall be conducted by instructors certified in writing by the manufacturer of the specific system.
1. Sessions shall be conducted for not less than four hour periods during normal working hours, i.e., Monday through Friday, 8:00 AM to 5:00 PM. Training session schedules shall conform to the requirements of the Owner; therefore, such schedules shall be submitted to the Owner for approval not less than two weeks prior to the training session. Training sessions for different systems shall not be scheduled concurrently. All training sessions shall be video-recorded on DVD disks for future use. At Owner's discretion, provisions shall be made to allow up to 4 Owner's personnel to participate in final system check out of all systems. Training shall be conducted on the project.
2. Video DVDs shall be of good quality both for video and audio and must be approved by the Architect. Provide FIVE copies to the Owner.

C. Training time to be included in base contracts for specific systems shall be as follows:

1. Security Monitoring and Control System - 20 hours
2. Surveillance Closed Circuit Television - 2 hours
3. Fire Alarm System - 8 hours
4. Integrated Communications- 8 hours
5. UPS Back Up and Connections - 2 hours
6. Duress System – 2 hours
7. Television Distribution System – 2 hours

3.3 EQUIPMENT CONNECTIONS

A. Interconnection with Electrical, Telephone/Data systems, HVAC, sprinkler control systems, kitchen fire extinguishing systems and gas shut off systems for complete monitoring or operation of the system as required by codes and these documents.

B. Interface to the lighting control system where required.

3.4 GROUNDING AND TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

A. For the purpose of determining the applicability of transient voltage surge suppression, the following applies:
   1. Conductors originating and terminating in the same building without transitioning the building footprint or the roof line at any point along its path is considered an interior circuit. Otherwise the circuit(s) are considered exterior.
   2. Conductors serving devices that are totally flush-mounted in an exterior wall, and in all other respects are an interior circuit as described above, is considered an interior circuit.
   3. Conductors serving exterior wall mounted or roof-mounted devices are considered an exterior circuit.

B. All interior 120 volt power circuits supplying power to Division 28 components shall be protected by surge protection devices prior to the connected components.
   1. Where the components are designed to connect to a standard 120 volt power outlet, plug strip type surge protection may be utilized.
   2. Where 120 volt circuits are routed totally interior to the building or are serving multiple wide spread components of the system, the surge protection shall be provided in an enclosure in close proximity to the breaker panel.

C. Exterior signal and/or power conductors (including conductors connected to power supplies), surge protection devices shall be provided at the origin and destination locations including arrangements where the origin and destination locations are in the same building.
   1. Conductors serving multiple exterior devices shall be equipped with surge suppression devices at each connection point.

D. For surge protection devices mounted in interior spaces or surface-mounted on the exterior of a building, connect all surge protection components, except plug strips, to a No. 6 AWG copper conductor from the building grounding system in accordance with Article 250 of the National Electrical Code.
   1. Grounding conductors for equipment surface-mounted to the building shall be routed to the interior of the building in conduit with no other conductors.
   2. Surge protection devices shall be housed in separate enclosure’s from the equipment being served.

E. In equipment rooms, control rooms and other locations containing Division 28 equipment connect all non-current carrying metal parts to building ground as prescribed above, provide a ground bus bar, connected to building ground, in each location to collect the individual grounding conductors. Ground all equipment enclosures, including computers, monitors, and the associated raceway system.

F. Enclosures and surge protection devices for equipment mounted remotely from buildings shall be bonded to 10 foot ground rod(s) buried with top of rod 12 inches below grade. Surge protection devices shall be enclosed within their own protective enclosure.

G. Surge suppression devices shall be multi-stage series hybrid devices (MOV and Capacitive Filtering) which shall fail open or shorted to prevent the operation of the connected equipment. Fuses shall not be used for surge protection. The devices shall be modular plug-in type for easy replacement. The devices shall be the product of a manufacturer whose primary function is manufacturing TVSS devices and shall meet the requirements of the following standards/publications:
1. UL 497B
2. UL 1449 (must meet the 330 Volt suppression rating)
3. IEEE 587 Category B impulse and ring wave tests
4. The National Electric Code (NFPA 70 - Current Edition)

H. Provide shop drawings detailing the protection application and letters from the manufacturer(s) confirming the devices are of the type compatible with the equipment served and will cause no operational difficulties.

3.5 ENGINEER'S APPROVAL

A. Installation of the Security Control and Monitoring System and the Fire Alarm System shall not begin until detailed shop drawings, cut sheets for the system, and specifications have been approved by the Engineer.

END OF SECTION

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SECTION 28 0513 - WIRES AND CABLES - SPLICES AND TERMINATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The work covered under this section of the specifications consists of the installation of "all wiring" for conductor types for the security, communications and alarm systems as specified in Division 28. Conductors used for electronic signals transmission are specified with the specific system or equipment in other sections of Division 28 but shall also comply with this section of the specifications. Conductors or cables that extend beyond the buildings are included. All materials shall be provided under this section of the specifications.
   1. Coordinate installation of conductors with other work required under Division 28 specifications.
   2. Each type of system wiring shall not be installed in same raceway with other systems.
   3. Homeruns for locking shall be installed as shown on drawing. Combination of several locking devices shall not be grouped in single homerun unless shown on the drawings.
   4. Homeruns for systems specified in Division 28 shall not be combined in single homerun conduits in housing units from pod-to-pod, for systems such as intercoms, PA, microphones, etc. This is to isolate wiring in an associated POD from any other POD.
   5. Wire fill for any conduits shall not exceed 40 percent fill in any locations.
   6. Junction box and outlet boxes wire fill shall not exceed that allowed by NEC.
   7. All wiring or cables installed in a damp or wet location as defined by the NEC shall be UL listed for damp and wet locations.
   8. All conductors or cables shall have size, grade of insulation, voltage, UL listing, manufacturer's name and (if rated for damp and wet locations) permanently marked on the outer cover or jacket not exceeding 24".

B. Related Work specified elsewhere, as listed below but not limited to:
   1. Raceway Systems: see Division 28
   2. All systems as specified in Division 28
   3. Builder’s Hardware
   4. Security Hardware
   5. Division 26 Electrical
   6. Division 21 Fire Suppression Systems
   7. Division 23 HVAC

1.3 QUALITY ASSURANCE

A. Industry Referenced Standards. The following specifications and standards are incorporated into and become a part of this Specification by Reference.
   1. Underwriters' Laboratories, Inc. (UL) Publications:
      a. No. 44 Rubber - Insulated Wire and Cables
      b. No. 83 Thermoplastic - Insulated Wires
      c. No. 493 Thermoplastic - Insulated Underground Feeder and Branch Circuit Cables
      d. No. 486 Wire Connectors and Soldering Lugs
   2. Insulated Cable Engineers Association Standards (ICEA):
      a. S-61-402 Thermoplastic Insulated Wire and Cable
   3. National Electrical Manufacturer's Standards (NEMA):

a. WC-5 Thermoplastic Insulated Wire and Cable
4. National Fire Protection Association Publication (NFPA):
a. No. 70 National Electrical Code (NEC)
5. ANSI EIA/TIA Standards

B. Acceptable Manufacturers. Products produced by the following manufacturers which conform to this specification are acceptable.
1. Hydraulically applied conductor terminations:
a. Square D
b. Burndy
c. Ilsco
d. Scotch (3M)
e. Thomas and Betts (T&B)
f. Anderson
2. Mechanically applied (crimp) conductor terminations:
a. Scotch (3M)
b. Ideal
c. Thomas and Betts (T&B)
d. Burndy
3. Vinyl electrical insulating tape:
a. Scotch (3M)
b. Tomic
c. Permacel
4. Encapsulated insulating kits:
a. Scotch (3M)
b. Raychem
c. Essex Group, Inc.
5. Portable cable fittings:
a. Crouse Hinds
b. Appleton
c. T&B
6. Insulated cable:
a. Brand-Rex Co.
b. Cablec Corp.
c. Carol Cable Co., Inc.
d. The Okonite Co.
e. Pirelli Cable Corp.
f. Senator Wire and Cable Co.
g. Southwire Co.
h. Bolden
7. Cables & wire shall be from the same manufacturer for like materials

C. Performance: Conductors shall be electrically continuous and free from splices, short circuits or grounds. All open, spliced, shorted or grounded conductors and any with damaged insulation shall be removed and replaced with new material free from defects.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS REQUIREMENTS

A. Provide all materials under this section of the specifications.

B. All wire and cable shall be UL listed and shall bear a UL label along the conductor length at intervals not exceeding 24 inches.

C. All conductors shall have size, grade of insulation, voltage and manufacturer's name permanently marked on the outer cover at intervals not exceeding 24 inches and as required by NEC.

D. The minimum size of emergency electrical systems conductors feeding equipment shall not be smaller than allowed per NEC.

E. Insulation voltage level must comply with NEC for cable used on specific system.

2.2 PRODUCT/MATERIALS DESCRIPTION

A. Conductors No. 10 AWG and smaller shall be stranded copper, 90 C type THHN/THWN or XHHN, unless otherwise indicated on the drawings, as required by the National Electrical Code.

B. Control conductors for use on 120 volt control wiring systems shall be No. 12 AWG stranded type THHN/THWN/XHHW, unless indicated otherwise on the drawings.

C. Taps (No. 10 AWG and smaller) Connectors for stranded conductors shall be crimp-on type with integral insulating cover, or heat shrink rated at 600 volt 105 C.

D. Taps (No. 8 and larger) - Hydraulically applied crimping sleeve or tap connector sized for the conductors. Insulate the hydraulically applied connector with 90 C, 600 volt insulating cover provided by the connector manufacturer. Insulator materials and installation shall be approved for the specific application, location, voltage and temperature and shall not have an insulation value less than the conductors being joined.

E. Electrical insulating tape shall be 600 volt, flame retardant, cold and weather resistant, minimally .85 mil thick plastic vinyl material; Scotch No. 88, Tomic No. 85, Permacel No. 295.

PART 3 - EXECUTION

3.1 EXECUTION

A. Install all wiring in raceway system unless noted otherwise on the drawings.

3.2 Connect all conductors. Torque each terminal connection to the manufacturers recommended torque value. A calibrated torquing tool shall be used to insure proper torque application. Termination torque values shall be provided as part of the shop drawings. At the request of the architect the systems integrator shall provide certification of calibration for each torquing device on the site as part of final testing and acceptance.

A. All conductors shall be tested to be continuous and free of short circuits and grounds.

B. Identification
1. Conductors within pull boxes shall be grouped and identified with nylon tie straps with identification tag.
2. Identify each control conductor at its terminal points with wrap around tape wire markers. I.D. to indicate terminal block and point designation, or other appropriate identifying indication.
3. Refer to IDENTIFICATION section of these specifications for additional identification requirements.

C. Color Code Conductors.
1. Color code branch circuit conductors.
2. Coding shall be as follows:
a. 208Y/120 volt three-phase four-wire wye system:
1) Phase A: Black

2) Phase B: Red
3) Phase C: Blue
4) Neutral: White

b. Grounding conductors shall be green. Grounding conductors for isolated ground circuits shall be green with a yellow trace.

D. Group and lace with nylon tie straps all conductors within enclosures, i.e., terminal cabinets, fire alarm cabinets, program instruments, control cabinets control panels etc.

E. Terminate conductors No. 10 AWG and smaller specified in this division to be stranded, with crimp type lug or stud. Direct termination of stranded conductors without crimp terminator to terminal screws, lugs, or other points is not permitted even if terminal is rated for stranded conductors. Crimp terminal shall be of a configuration suitable for termination point. Make all crimps with a tool as listed by the manufacturer and as listed by UL for the crimp lug being used.

F. Splices in conductors or cables are not permitted even if conductors are installed in a pull box.

G. All cables installed in conduit underground or in slabs that is outside of the foot print of the building shall be shielded cable and be rated for direct burial.

H. Install a #6 bare ground wire on top of all conduit runs outside of the footprint of the building and ground to a 10 ft ground rod at each end and every 100', this includes all duct banks. All connections shall be CAD welded.

END OF SECTION

SECTION 28 0528 - RACEWAYS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 26 05 48 Vibration and Seismic Control for Electrical Systems applies to the work of this section.

1.2 SUMMARY

A. This section covers the complete interior and exterior raceway system.

B. Definition: The term conduit, as used in this Specification, shall mean any or all of the raceway types specified.

1.3 QUALITY ASSURANCE

A. Referenced Industry Standard: The following specifications and standards are incorporated into and become a part of this Specification by reference.
   1. Underwriters' Laboratories, Inc. (UL) Publications:
      a. No. 1 Flexible Metal Electrical Conduit
      b. No. 6 Rigid Galvanized Conduit
      c. No. 467 Electrical Grounding and Bonding
      d. No. 651 Rigid Nonmetallic Electrical Conduit
      e. No. 797 Electrical Metallic Tubing
      f. No. 1242 Intermediate Metal Conduit
   2. American National Standards Institute (ANSI):
      a. C-80.1 Rigid Galvanized Conduit.
      b. C-80.3 Electrical Metallic Tubing.
   3. National Fire Protection Association (NFPA):
      a. No. 70 National Electrical Code (NEC).

B. Acceptable Manufacturers: Products of the following manufacturers, which comply with these specifications, are acceptable.
   1. Metallic Conduit Fittings:
      a. Appleton
      b. Carlon
      c. Crouse Hinds
      d. Killark
      e. O-Z/Gedney
      f. RACO
      g. Thomas and Betts
   2. Support Channel:
      a. Kindorf
      b. Powers
      c. Unistrut
   3. Non-Metallic Conduit and Fittings:
      a. Carlon
      b. Certainteed
      c. Thomas and Betts

C. Coordination
   1. Coordinate conduit installation with all equipment furnished.
   2. Coordinate conduit installation with contract documents and other contractors. Adjust installation to eliminate conflicts. Review all shop drawings submitted under this and other sections to insure coordination with all equipment requiring service and to avoid conflict interferences. Coordinate installation sequence with other contractors to avoid conflicts including equipment access and provide the fastest overall installation schedule.
   3. The systems integrator shall provide certification of raceway coordination as part of the shop drawing submittals.

1.4 STORAGE AND HANDLING

A. All materials shall be protected until installed in place on the project.

B. All conduits stored on site prior to installation shall be stored on a surface off of the ground and shall be protected from the direct rays of the sun and from debris.

C. Damaged, oxidized, warped, improperly stored material or material with foreign debris will be removed from the project and replaced with new materials.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS REQUIREMENTS

A. Furnish all materials specified herein.

B. All conduit and fittings shall be UL listed and bear a label by Underwriters' Laboratories for use as raceway system for electrical conductors.

C. Raceway is required for all wiring, unless specifically indicated or specified otherwise.

D. Size: The minimum size of conduit shall be 3/4". The size of all conduits shall be in accordance with the NEC, but, not less than indicated on the drawings. 3/8" flexible conduits may not be used for any application or connections to equipment specified in these sections of the specifications.

2.2 EMT CONDUIT FITTINGS

A. Electrical Metallic Tubing (EMT) couplings and connectors shall be steel "concrete tight" type. Malleable iron, die cast or pressure cast fittings are not permitted. Fittings 2.0" and smaller shall be gland and ring compression type. Connectors for conduits 2.5" and larger shall be set screw type with two (2) screws each or compression type. Couplings for conduits 2.5" and larger shall be set screw type with four (4) screws each or compression type. All connectors shall be insulated throat type.

2.3 RIGID AND IMC CONDUIT FITTINGS

A. Fittings for rigid steel and IMC conduit shall be standard threaded couplings, locknuts, bushings and elbows. All materials shall be steel or malleable iron only. Set screw or non-threaded fittings are not permitted. Bushings shall be metallic insulating type consisting of insulating insert molded or locked into the metallic body of the fittings.

2.4 NON-METALLIC CONDUIT AND FITTINGS

A. Non-metallic conduit shall be heavy wall, Schedule 80 PVC.

B. Non-metallic conduit fittings shall be of the same material as the conduit furnished and be the product of the same manufacturer. Glue used for non-metallic conduit shall be as specified by the manufacturer of the conduit provided.

2.5 METALLIC CONDUIT AND FITTINGS

A. All parts and hardware shall be zinc-coated or have equivalent corrosion protection.

B. Conduit straps shall be single-hole cast metal type or two-hole galvanized metal type. Conduit clamps made of spring steel shall not be used for any reason, except on metal stud walls.

C. Conduit support channels shall be 1.5" x 1.5" x 14 gauge galvanized (or with equivalent treatment) channel. Channel suspension shall be 3/8" threaded steel rods. Use swivel type connector to attach suspension rods to structure. Spring steel clips are not acceptable. Wire or chain is not acceptable for conduit hangers.

D. Individual conduit hangers shall be galvanized spring steel specifically designed for the purpose, sized appropriately for the conduit type and diameter, and have pre-assembled closure bolt and nut and provisions for receiving threaded hanger rod. Support with 1/4" threaded steel rod for individual conduits 1.5" and smaller and 3/8" rod for individual conduits 2.0" and larger.

E. Individual conduit straps on metal studs shall be spring steel and should wrap around entire face of stud securely biting into both edges and have provisions for screwing into stud. Sized for conduit to be supported. Tie wraps are not acceptable.

F. Support multiple conduits from metal studs using preassembled bar hanger assembly consisting of hanger bar, retaining clips and conduit straps.

G. Refer to Section 28 05 28 29 - SUPPORTING DEVICES of these specifications for additional material requirements.

2.6 FLEXIBLE CONDUIT AND FITTINGS

A. Flexible conduit shall be steel metallic type. Where specified herein, indicated on the drawings, or when used in damp or wet locations, as classified by the National Electrical Code, flexible conduit shall be liquid tight.

B. All flexible conduit shall be classified as suitable for system grounding.

C. Connectors for flexible conduit shall be steel insulated throat type rated as suitable for system ground continuity. Connectors for liquid tight flexible conduit shall be screw-in ground cone type.

D. Flexible conduit shall not be less than 1/2" trade size and in no case shall flexible conduit size be less than permitted by the National Electrical Code for the number and size of conductors to be installed herein.

2.7 MISCELLANEOUS CONDUIT FITTINGS AND ACCESSORIES

A. Vinyl all weather electrical tape for corrosion protection shall be Scotch #88, Tomic #85, Permacel #295.

B. Expansion and deflection couplings shall be in accordance with UL 467 and UL 514. They shall accommodate 3/4" deflection, expansion, or contraction in any direction and shall allow 30 degree angular deflections. Couplings shall contain an internal flexible metal braid to maintain raceway system ground continuity.

C. Fire and smoke stop materials shall be rock wool fiber, silicone foam, or silicone sealant, UL rated to maintain the fire floor or fire wall partition rating.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General
1. Conceal all conduits, except in unfinished spaces such as equipment rooms or where indicated by symbol on the drawings.
2. Leave all empty conduits with a 200 pound test nylon cord pull line extending a minimum of 24 inches from the end of the conduits.
3. Install complete raceway runs prior to installation of cables or wires. Cables and wire run in incomplete raceways shall be removed and replaced.
4. Flattened, dented, or deformed conduits are not permitted and shall be removed and replaced.
5. Secure rigid conduit i.e., rigid galvanized conduit and intermediate metal conduit, to sheet metal enclosures with two (2) locknuts and insulated bushing. Secure EMT to sheet metal enclosures with insulated throat connectors.
6. Fasten conduit support device to structure with wood screws on wood, toggle bolts on hollow masonry, anchors as specified on solid masonry or concrete, and machine bolts, clamps, or spring steel clips, on steel. Nails are not acceptable.
7. Protect conduits against dirt, plaster, and foreign debris with conduit plugs. Plugs shall remain in place until all masonry is complete. Protect conduit stub-ups during construction from damage; any damaged conduits shall not be used.
8. Seal all conduits originating from outside building from below grade, all conduits entering refrigerated spaces, i.e., freezers and coolers, and all conduits entering exterior mounted electrical equipment with insulating electrical putty to prevent entrance of moisture.
9. Install conduit with wiring, including homeruns as indicated on the drawings. Any change resulting in a savings in labor or materials is to be made only in accordance with a contract change. Deviations shall be made only where necessary to avoid interferences and when approved by Architect by written authorization.
10. Conduits which penetrate roof membranes shall be installed in accordance with manufacturer's recommendations and architectural specifications. The systems integrator shall coordinate roof penetrations with the roofing contractor.
11. Install a complete telephone/data, video visitation/arraignment raceway systems as specified in other section of these specifications and as indicated on the drawings. The minimum conduit size shall be not less than 1 inch. All bends in conduit shall be long sweep radius. Install no more than two 90 degree bends in raceways between pull or outlet boxes and backboard/cabinets. Install no more than two outlet boxes on the same home run unless approved by the Owner.
12. Separate raceway systems are to be installed for power systems and for control, signal and communications systems. Do not install control, signal or communications cables in the same raceways, unless indicated otherwise on the drawings.
13. Provide expansion fitting in all conduits where length of run exceeds 200 feet or where conduits pass building expansion joints.

B. Uses Permitted
1. Conduits installed within concrete floor slabs which are in direct contact with grade shall be galvanized rigid steel (GRS) or intermediate metal conduit (IMC). Conduits which penetrate the building roof shall be galvanized rigid steel (GRS) or intermediate metal conduit (IMC). Conduits installed within concrete floor slabs which are above grade shall be galvanized rigid steel (GRS), intermediate metal conduit (IMC), or schedule 40 Heavy Wall PVC. Where transition is made from raceway in slab to any type of raceway out of slab, make transition with rigid galvanized elbow. For corrosion protection, where elbow penetrates surface, wrap with vinyl all weather electrical tape or coat with bituminous asphaltic compound, for 6" above and below concrete surface.
2. Conduits installed in direct contact with earth shall be schedule 40, heavy wall PVC.

3. All other conduit, unless excluded herein, not permitted in accordance with the National Electrical Code, or otherwise indicated on the drawings, shall be electrical metallic tubing (EMT).
4. Conduit types shall not be mixed indiscriminately with other types in the same run, unless specified herein or required by the NEC.
5. Use flexible conduit for connections flush mounted Division 17 Devices.
    a. Flexible conduit shall not be used above hard ceilings sheetrock or plaster, etc.
    b. Flexible conduit from outlet box to flush mounted devices shall not exceed 6-ft. in length.
    c. Maintain ground continuity through flexible conduit with green equipment grounding conductor; do not use flexible conduit for ground continuity.
    d. Liquid tight conduit shall be used to connect equipment in the kitchen area, laundry area, mechanical equipment rooms, exterior installations, below access floors connecting data processing other equipment.
6. No conduit requiring cutting of cross-webs of concrete masonry units is permitted. Conduit shall be threaded through cells or concrete masonry units lowered around conduit. Neither horizontal joint reinforcement nor bond beam reinforcement shall be cut for conduit installation.
7. All conduits installed exposed from the finished floor to a minimum height of 10 ft. above the floor shall be galvanized rigid steel (GRS) or intermediate metallic conduit (IMC).
8. Any conduits installed exposed, which have been specifically indicated on the drawings as acceptable, in areas accessible to inmates shall be galvanized rigid steel.
9. Where hazardous locations, as classified by the National Electrical Code, exist, all conduits and fittings and the installation of these materials shall comply with Article 500 of the National Electrical Code.
10. All conduits entering refrigerated spaces shall be galvanized rigid steel.
11. Concrete encased underground duct banks shall be installed where indicated on the drawings for communication cable system. Duct bank conduits shall be non-metallic.

C. Below Grade Raceway Installations
1. Direct Burial Conduit
    a. Install top of conduits 24" minimum below finished grade.
    b. Install top of conduits 6" minimum below bottom of building slabs.
    c. Install top of conduits 30" minimum below grade, below roads and any other paved surfaces.
    d. Where transition is made from below grade PVC installation to a metallic conduit system above grade or slab, make transition with long sweep rigid galvanized elbow and extend through slab or above grade with galvanized rigid steel conduit. For corrosion protection, where the elbow penetrates surface, wrap with vinyl all weather electrical tape or coat with bituminous asphaltic compound, for 6" above and below concrete surface.
    e. For excavation and backfilling, refer to earthwork specification section.
    f. Conduit shall be run following the most direct route between points.
2. Duct Bank
    a. Duct bank configuration shall be in accordance with the details indicated on the drawings.
    b. Duct banks shall be installed with top of concrete not less than 24" below finished grade or pavement nor more than 36" unless position of existing underground utilities prevents installation at this depth. Under such conditions, depth may be reduced in accordance with the National Electrical Code. Refer to EARTHWORK section of the specification for excavation and backfilling. The bottom of the conduit trench shall be flat and level.
    c. Conduits shall be anchored to and supported in the trench with fiber or plastic conduit spacers, designed and provided by the manufacturer for the purpose, and installed not more than 5 foot on center. Stagger conduit couplings a minimum of 12".

d. Change in direction exceeding 10 degrees shall be made with long sweep bends with minimum radius of curvature of 25 ft. All 90 degree elbows shall be factory made and shall be long sweep type (24" minimum radius).
e. Conduit joints shall be watertight and shall be made by the application of PVC solvent, specified by the manufacturer of the conduit. Solvent shall be applied to interior of coupling and exterior of conduit, in accordance with manufacturer's recommendations.
f. Concrete for use with duct banks shall be 2500 lb. concrete with 1/2" aggregate. Slump shall be between 7" and 8". Refer to CONCRETE section of these specifications for additional requirements for concrete.
g. Below all roads and paved areas, duct banks shall be reinforced by the installation of No. 5 bars 6" on center at each corner and on all sides, parallel to duct, and with continuous No. 3 bar perpendicular to duct on 16" centers. Concrete cover for reinforced duct banks shall be not less than 6" with not less than 3" of concrete cover on reinforcing steel. Where reinforced duct bank is provided, reinforcing shall extend not less than 10 ft. beyond each side of road or paved area.
h. All open conduit ends shall be plugged during construction to prevent water, mud, concrete and debris from entering duct banks and manholes. Prior to the installation of cables, each conduit shall be cleaned by pulling a standard, flexible mandrel not less than 12" long, with diameter approximately 1/4" less than inside diameter of conduit, through the conduit. In addition, a brush with soft bristles and diameter approximately equal to inside diameter of conduit shall be pulled through conduit.
i. All duct banks shall be sloped to drain toward manholes and shall be laid with a minimum grade of 4" per 100 ft. Terminations in manholes shall be made with bell ends.
j. Construction of duct banks shall proceed from one end to the other, not from each end to the center.
k. The Contractor shall notify the Owner’s personnel prior to backfilling any trenches to allow the Owner to review and witness the backfilling of trenches.

D. Raceway Installations Within Concrete
1. Conduit shall be run following the most direct route between points.
2. Conduit shall not be installed in concrete which is less than 3" thick or where the outside diameter is larger than 1/3 of the slab thickness.
3. Conduits installed in concrete slabs shall be buried in the concrete slab. Wire low conduits to upper side of the bottom reinforcing steel, and upper conduits to the lower side of the top reinforcing steel. Separate parallel runs of conduits within slab by at least 1".
4. Conduits shall not be installed within shear walls unless specifically indicated on the drawings. Conduits shall not be run directly below and parallel with load bearing walls
5. Protect each metallic conduit installed in concrete slab or conduits 1.5" and smaller passing through a concrete slab against corrosion where conduit enters and leaves concrete by wrapping conduit with vinyl all-weather electrical tape.
6. The maximum projection of conduit stub-up and bushing above slab shall be 3".
7. Protect all conduits entering and leaving concrete floor slabs from physical damage during construction.
8. Install all conduits penetrating rated fire floors to maintain the fire rating of the floor penetrated.

E. Concealed (Above Ceilings and in Walls) and Exposed Raceway Installation
1. Conduit shall be run parallel or at right angles to existing walls, ceilings, and structural members.
2. Support conduits at intervals not exceeding 10 ft. and within three feet of each outlet, junction box, cabinet or fitting. Attach individual conduits to structural steel members with beam conduit clamps and to non-metallic structural members with two-hole conduit

straps. For exposed conduits and where conduits must be suspended below structure, single conduit runs shall be supported from structure by hangar rod and conduit clamp assembly. Multiple conduits shall be supported by trapeze type support suspended from structure. Do not attach conduits to ceiling suspension system channels or suspension wires.

3. Attach conduits larger than 1 inch trade diameter to or from structure on intervals not exceeding 10 ft. with conduit beam clamps, one-hole conduit straps or trapeze type support in accordance with support systems described for conduits.
4. Exposed conduits shall be painted, see painting section of the specifications.
5. Conduits shall not pass through structural members.
6. Install conduit sleeves in slabs where conduits 2 inches and larger pass through. Sleeves shall extent 1 inch minimum above finished slab. Seal all spare sleeves and between conduits and sleeves to maintain fire rating and to make watertight and smoketight.
7. Install all conduits or sleeves penetrating rated fire walls or fire floors to maintain fire rating of wall or floor.
8. Conduits rigidly secured to building construction on opposite sides of a building expansion joint shall be provided with an expansion and deflection coupling. In lieu of an expansion coupling, conduits 2-1/2 inches and smaller may be provided with junction boxes on both sides of the expansion joint connected by 15 inches of slack flexible conduit with bonding jumper.
9. Do not install exposed conduit systems in inmate housing area and other areas normally accessible to inmates unless such installations are specifically indicated on the drawings. Where exposed conduit is indicated on the drawings, all conduits shall be rigid metallic type and all outlet boxes shall be cast metal type with threaded hubs.
    a. Install conduits flat against wall; offsets or "kicks" shall be permitted only to enter outlet box.
    b. Support conduits on centers not exceeding 5 feet and within 12 inches of each outlet box using two-hole conduit straps attached to surface with nonremovable break off security type bolts.

3.2 ADJUSTMENT, CLEANING AND PROTECTION

A. Clean: Upon completion, clean all installed materials of paint, dirt, and construction debris. All conduit systems shall be cleaned of water and debris prior to the installation of any conductors. The Owner shall observe the cleaning of the conduit systems prior to pulling wire.

B. All open conduit ends shall be plugged during construction to prevent water, mud, concrete and debris from entering duct banks and manholes. Prior to installation of cables, each conduit shall be cleaned by pulling a standard, flexible mandrel not less than twelve inches long, with diameter approximately 1/4" less than inside diameter of conduit, through the conduit. In addition, a brush with soft bristles and diameter approximated equal to inside diameter of conduit shall be pulled through conduit.

3.3 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation to install conduits, duct banks, manholes as indicated on the drawings or specified herein. During excavation, pile material for backfilling back from the banks of the trench to avoid overloading and to prevent slides and cave-ins. Provide shoring as required by OSHA Standards. Remove and dispose of all excavated materials not to be used for backfill. Grade to prevent surface water from flowing into trenches and excavation. Remove any water accumulating therein by pumping. Do all excavation by open cut. No tunneling shall be done unless indicated on the drawings or unless written permission is received from the Architect.

B. Grade the bottom of trenches to provide uniform bearing and support for conduits, or duct bank on undisturbed soil at every point along its entire length. Tamp overdepths with loose, granular, moist earth. Remove unstable soil that is not capable of supporting equipment or installation

and replace with specified material for a minimum of 12 inches below invert of equipment or installation.

C. Backfill the trenches with excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand and gravel or soft shale, free from large clods of earth and stones, deposited in 6 inch layers and rammed until the installation has a cover of not less than the adjacent ground but not greater than 2 inches above existing ground. Backfilling shall be carried on simultaneously on both sides of the trench so that injurious pressures do not occur. Compaction of the filled trench shall be at least equal to that of the surrounding undisturbed material. Do not settle backfill with water. Reopen any trenches not meeting compaction requirements or where settlement occurs, refill, compact, and restore surface to grade and compaction indicated on the drawings, mounded over and smoothed off. The Owner shall observe all backfilling of trenches and excavations.

END OF SECTION

SECTION 28 0529 - SUPPORTING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 26 05 48 Vibration and Seismic Control for Electrical Systems applies to the work of this section.

1.2 SUMMARY

A. Extent of supports, anchors, sleeves and seals is indicated by drawings and schedules and/or specified in other Division or sections of these specifications.

B. Types of supports, anchors, sleeves and seals specified in this section include the following:
1. Clevis hangers.
2. Riser clamps.
3. C-clamps.
4. I-beam clamps.
5. One-hole conduit straps.
6. Two-hole conduit straps.
7. Round steel rods.
8. Expansion anchors.
9. Toggle bolts.
10. Wall and floor seals.

C. Supports, anchors, sleeves and seals furnished as part of factory fabricated equipment are specified as part of that equipment assembly in other Division or sections of these specifications.

1.3 QUALITY ASSURANCE

A. NEC Compliance: Comply with NEC requirements as applicable to construction and installation of electrical supporting devices.

B. NECA Compliance: Comply with National Electrical Contractors Association's "Standard of Installation" pertaining to anchors, fasteners, hangers, supports, and equipment mounting.

C. UL Compliance: Provide electrical components which are UL-listed and labeled.

D. FS Compliance: Comply with Federal Specification FF-S-760 pertaining to retaining straps for conduit, pipe and cable.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's data on supporting devices including catalog cut sheets, specifications, and installation instructions, for each type of support, anchor, sleeve and seal.

B. Shop Drawings: Submit dimensioned drawings of fabricated products, indicating details of fabrication and materials.

PART 2 - PRODUCTS

2.1 MANUFACTURED SUPPORTING DEVICES

A. General: Provide supporting devices which comply with manufacturer's standard materials, design and construction in accordance with published product information, and as required for complete installation; and as herein specified. Where more than one type of supporting device meets indicated requirements, selection is Installer's option.

B. Supports: Provide supporting devices of types, sizes and materials indicated; and having the following construction features:
1. Clevis Hangers: For supporting 2" rigid metal conduit; galvanized steel; with 1/2" diameter hole for round steel rod; approximately 54 lbs. per 100 units.
2. Riser Clamps: For supporting 5" rigid metal conduit; black steel; with 2 bolts and nuts, and 4" ears; approximately 510 lbs. per 100 units.
3. Reducing Couplings: Steel rod reducing coupling, 1/2" x 5/8"; black steel; approximately 16 lbs. per 100 units.
4. C-Clamps: Black malleable iron; 1/2" rod size; approximately 70 lbs. per 100 units.
5. I-Beam Clamps: Black steel, 1-1/4" x 3/16" stock; 3/8" cross bolt; flange width 2"; approximately 52 lbs. per 100 units.
6. One-Hole Conduit Straps: For supporting 3/4" rigid metal conduit; galvanized steel; approximately 7 lbs. per 100 units.
7. Two-Hole Conduit Straps: For supporting 3/4" rigid metal conduit, galvanized steel; 3/4" strap width; and 2-1/8" between center of screw holes.
8. Hexagon Nuts: For 1/2" rod size; galvanized steel; approximately 4 lbs. per 100 units.
9. Round Steel Rod: Black steel; 1/2" diameter; approximately 67 lbs. per 100 feet.
10. Offset Conduit Clamps: For supporting 2" rigid metal conduit; black steel; approximately 200 lbs. per 100 units.

C. Anchors: Provide anchors of types, sizes and materials indicated, with the following construction features:
1. Toggle Bolts: Springhead; 3/16" x 4"; approximately 5 lbs. per 100 units.
2. Expansion sleeve anchors by Hilti or Phillips Redhead: 1/2"; approximately 38 lbs. per 100 units.
3. Manufacturers: Subject to compliance with requirements, provide anchors of one of the following:
   a. Ackerman Johnson Fastening Systems Inc.
   b. Hilti
   c. Ideal Industries, Inc.
   d. Joslyn Mfg and Supply Company
   e. McGraw Edison Company
   f. Phillips Redhead
   g. Rawlplug Company Inc.

D. Sleeves and Seals: Provide sleeves and seals, of types, sizes and materials indicated, with the following construction features:
1. Wall and Floor Seals: Provide factory assembled watertight wall and floor seals, of types and sizes indicated; suitable for sealing around conduit, pipe, or tubing passing through concrete floors and walls. Construct seals with steel sleeves, malleable iron body, neoprene sealing grommets and rings, metal pressure rings, pressure clamps, and cap screws.

E. U-Channel Strut Systems:
1. Provide U channel strut system for supporting electrical equipment, 12 gage hot dip galvanized steel, of types and sizes indicated; construct with 9/16" diameter holes, 8" o.c. on top surface, with standard green finish, and with the following fittings which mate and match with U channel.

a. Channel hangers.
b. End caps.
c. Beam clamps.
d. Wiring studs.
e. Thinwall conduit clamps.
f. Rigid conduit clamps.
g. Conduit hangers.
h. U bolts.

2. Manufacturers: Subject to compliance with requirements, provide channel systems of one of the following:
a. Allied Tube and Conduit Corporation.
b. B Line Systems, Inc.
c. Elcen Metal Products Company.
d. Greenfield Mfg Company, Inc.
e. Midland-Ross Corporation.
f. OZ/Gedney Div.; General Signal Corporation.
g. Power-Strut Div.; Van Huffel Tube Corporation.
h. Unistrut Div.; GTE Products Corporation.

2.2 FABRICATED SUPPORTING DEVICES

A. Pipe Sleeves: Provide pipe sleeves of one of the following:
1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from the following gage metal: 3" and smaller, 20-gage; 4" to 6", 16-gage; over 6", 14" gage.
2. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe.
3. Iron Pipe: Fabricate from cast-iron or ductile-iron pipe.
4. Plastic Pipe: Fabricate from Schedule 80 PVC plastic pipe.

B. Sleeve Seals: Provide modular mechanical type seals, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

PART 3 - EXECUTION

3.1 INSTALLATION OF SUPPORTING DEVICES

A. Install hangers, anchors, sleeves and seals as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to insure supporting devices comply with requirements. Comply with requirements of NECA and NEC for installation of supporting devices.

B. Coordinate with other Division 28 work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.

C. Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal conduits to be supported together on trapeze type hangers where possible. Install supports in compliance with NEC requirements.

D. Torque sleeve seal nuts, complying with manufacturer's recommended values. Ensure that sealing grommets expand to form watertight seal.

E. Remove burrs from ends of pipe sleeves.

END OF SECTION

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SECTION 28 0553 - SYSTEM IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Extent of Division 28 identification work is as outlined by this specification.

B. Types of identification work specified in this section include the following but not limited to. See other Sections of these specifications:
1. Buried cable warnings.
2. Electrical power, control and communication conductors.
3. Operational instructions and warnings.
4. Danger signs.
5. Equipment/system identification signs.

C. Refer to Division 28 section INTEGRATED SECURITY SYSTEMS GENERAL, for equipment and system nameplates, and performance data; not work of this section.

1.3 QUALITY ASSURANCE

A. NEC Compliance: Comply with NEC as applicable to installation of identifying labels and markers for wiring and equipment.

B. UL Compliance: Comply with applicable requirements of UL Std 969, "Marking and Labeling Systems", pertaining to electrical identification systems.

C. ANSI Compliance: Comply with applicable requirements of ANSI Std A13.1, "Scheme for the Identification of Piping Systems".

D. NEMA Compliance: Comply with applicable requirements of NEMA Std No's WC-1 and WC-2 pertaining to identification of power and control conductors.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's data on electrical identification materials and products.

B. Samples: Submit samples of each color, lettering style and other graphic representation required for each identification material or system.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide electrical identification products of one of the following (for each type marker):
1. Almetek
2. Brady, W.H. Company
3. Calpico Inc.
4. Cole-Flex Corporation

5. Direct Safety Company
6. George-Ingraham Corporation
7. Griffolyn Company
8. Ideal Industries, Inc.
9. LEM Products, Inc.
10. Markal Company
11. National Band and Tag Company
12. Panduit Corporation
13. Seton Name Plate Company
14. Tesa Corporation

2.2 ELECTRICAL IDENTIFICATION MATERIALS

A. Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application selection is Installer's option, but provide single selection for each application.

B. Color-Coded Plastic Tape:
1. Provide manufacturer's standard self-adhesive vinyl tape not less than 3 mils thick by 1-1/2" wide.
a. Colors: Unless otherwise indicated or required by governing regulations, provide orange tape.

C. Underground-Type Plastic Line Marker:
1. Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates type of service of buried cable.

D. Cable/Conductor Identification Bands:
1. Provide manufacturer's standard vinyl-cloth self-adhesive cable/conductor markers of wrap-around type, either pre-numbered plastic coated type, or write-on type with clear plastic self-adhesive cover flap; numbered to show circuit identification.

E. Plasticized Tags:
1. Manufacturer's standard pre-printed or partially pre-printed accident-prevention and operational tags, of plasticized card stock with matte finish suitable for writing, approximately 3-1/4" x 5-5/8", with brass grommets and wire fasteners, and with appropriate pre-printed wording including large-size primary wording, e.g., DANGER, CAUTION, DO NOT OPERATE.

F. Self-Adhesive Plastic Signs:
1. Provide manufacturer's standard, self-adhesive or pressure-sensitive, pre-printed, flexible vinyl signs for operational instructions or warnings; of sizes suitable for application areas and adequate for visibility, with proper wording for each application, e.g., 208V, EXHAUST FAN, RECTIFIER.
2. Colors: Unless otherwise indicated, or required by governing regulations, provide white signs with black lettering.

G. Baked Enamel Danger Signs:
1. General: Provide manufacturer's standard "DANGER" signs of baked enamel finish on 20-gage steel; of standard red, black and white graphics; 14" x 10" size except where 10" x 7" is the largest size which can be applied where needed, and except where larger size is needed for adequate vision; with recognized standard explanation wording, e.g., HIGH VOLTAGE, KEEP AWAY, BURIED CABLE, DO NOT TOUCH SWITCH.

H. Engraved Plastic-Laminate Signs:

1. Provide engraving stock melamine plastic laminate, complying with FS L-P-387, in sizes and thicknesses indicated, engraved with engraver's standard letter style of sizes and wording indicated, black face and white core plies (white letter color) except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
2. Thickness: 1/8", except as otherwise indicated.
3. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate substrate.

2.3 LETTERING AND GRAPHICS

A. General: Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturer or as required for proper identification and operation/maintenance of electrical systems and equipment. Comply with ANSI A13.1 pertaining to minimum sizes for letters and numbers.

B. As part of the close out documentation the systems integrator shall provide a complete typed legend of all wire and equipment including full descriptions and locations.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION

A. General Installation Requirements:
1. Install electrical identification products as indicated, in accordance with manufacturer's written instructions, and requirements of NEC and OSHA.
2. Coordination: Where identification is to be applied to surfaces which require finish, install identification after completion of painting.
3. Regulations: Comply with governing regulations and requests of governing authorities for identification of electrical work.

B. Conduit Identification:
1. Where electrical conduit is specified to be exposed identified by color-coded method, apply color-coded identification on electrical conduit. Color code for conduit must be submitted with shop drawings for approval.

C. Box Identification:
1. After completion, use an indelible wide tip marker to indicate on each junction and pull box and their covers the designation of the circuits contained therein, i.e., A-1, 3, 5, fire alarm, locking, etc., for each system specified in Division 28.

D. Underground Cable Identification:
1. During back-filling/top-soiling of each exterior underground electrical, signal or communication cable, install continuous underground type plastic line marker, located directly over buried line at 6" to 8" below finished grade. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16", install a single line marker.
2. Install line marker for every buried cable, regardless of whether direct-buried or protected in conduit or duct bank.

E. Cable/Conductor Identification:
1. Apply cable/conductor identification, including voltage, phase and feeder number, on each cable/conductor in each box/enclosure/cabinet where wires of more than one circuit or communication/signal system are present. Match identification with marking system used

in panelboards, shop drawings, contract documents, and similar previously established identification for project's electrical work. Refer to WIRES AND CABLES section of these specifications for color coding requirements. All wiring identification shall match as built drawings.

F. Operational Identification and Warnings:
1. Wherever required by OSHA or directed by the Owner, to ensure safe and efficient operation and maintenance of electrical systems, and electrically connected mechanical systems and general systems and equipment, including prevention of misuse of electrical facilities equipment by unauthorized personnel, install self-adhesive plastic signs or similar equivalent identification, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for intended purposes.

G. Danger Signs:
1. In addition to installation of danger signs required by governing regulations and authorities, install appropriate danger signs at locations indicated and at locations subsequently identified by Installer of electrical work or the Owner as constituting similar dangers for persons in or about project.
a. High Voltage: Install danger signs wherever it is possible, under any circumstances, for persons to come into contact with electrical power of voltages higher than 110-120 volts.
b. Critical Switches/Controls: Install danger signs on switches and similar controls, regardless of whether concealed or locked up, where untimely or inadvertent operation (by anyone) could result in significant danger to persons, or damage to or loss of property.

H. Equipment/System Identification:
1. Install engraved plastic-laminate sign on each major unit of equipment in building; including central or master unit of each electrical system including communication/control/signal systems, unless unit is specified with its own self-explanatory identification or signal system. Except as otherwise indicated, provide single line of text, 1/2" high lettering, on 1-1/2" high sign (2" high where 2 lines are required), white lettering in black field. Provide text matching terminology and numbering of the contract documents and shop drawings. Provide signs for each unit of the following categories of electrical work:
a. Access panel/doors to electrical facilities.
b. Battery racks.
c. Telephone switching equipment.
d. Call system master station.
e. TV/audio monitoring master station.
f. Fire alarm master station.
g. Security monitoring master station.
h. All Division 28 Equipment Cabinets.
2. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate substrate. Identification of flush mounted cabinets and panelboards shall be on the outside of the device.

END OF SECTION

SECTION 28 2300 - INTEGRATED VIDEO SURVEILLANCE SYSTEM (CCTV)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General, Supplementary and Special Conditions and Division 01 Specification Sections, apply to this Section.

B. The Division 28 series of specifications describe systems that are integrated and or connected together to provide coordinated operations; therefore, individual sections do not stand alone. The installation and operational requirements of any given system may be determined only by review of the total series of Division 28 specifications, as well as other referenced specifications.
   1. As a requirement of this contract, the contractor will coordinate with the owner's agent for purposes of integrating the security monitoring and control system with the IP-CCTV system as provided herein. The contractor's participation will be coordination and definition of any required protocols or SDKs which must be achieved by owner's agent to create this integration. The contractor will not perform the integration nor will he be required to provide SDKs under this contract.

1.2 SUMMARY

A. This section of the specifications requires the complete installation of an integrated Video Surveillance System (VSS) as specified herein. Provide all labor, materials, equipment, and supervision to install, check out, adjust, and calibrate total system. All VSS switching and recording equipment shall be sized to provide 20% future growth capacity. All pictures shall be clear and free of snow, ground loops, or other conditions that will degrade the picture. When switching from camera to camera no delay shall exist and no roll or static shall be present on the monitors.

B. The work shall consist of the installation of a complete integrated closed circuit television system consisting essentially of, but not limited to, the following major components:
   1. Remote IP cameras, including lens, housings, motion operators, and mounting devices.
   2. Power over Ethernet (POE) provisions
   3. LCD Monitors with mounting devices for installation where indicated.
   4. IP over Ethernet equipment and network
   5. Network Attached Storage - RAID-5 Video storage
   6. Remote camera motion control provisions.
   7. Equipment mounting racks and cabinets.
   8. Systems wiring.
   9. System Local Area Network, video cards, NIC cards
   10. System Control, Management, Applications and Computer software

C. The VSS system shall provide remote monitoring and control at locations specified herein and elsewhere.

D. Digital video server and network attached storage (NAS) shall be utilized for recording of cameras as specified. Recording storage shall be sized to accommodate the required recording speeds, resolutions, and quality settings for a period of 30 days for all cameras.

E. In addition to the VSS coverage shown for the facility interior provide fixed and pan-tilt-zoom camera coverage of the exterior and entrances as indicated on the drawings. Where noted, the cameras shall be mounted on dedicated poles or building parapets and cover the exterior

features, exterior facility entrances, building entrances, fence control points and parking gates in their “home” preset position.

F. Pan-tilt-zoom and fixed cameras at the perimeter of the facility shall cover the facility entries, loading dock, gates, and other locations prescribed by the owner as presets and all other areas contained inside the secured perimeter.

PART 2 - PRODUCTS

2.1 CAMERAS GENERAL

A. Installation of each camera shall include mounting brackets and/or camera housings fully compatible with the camera provided. In general, interior camera will be dome type ceiling, corner or wall mount. At inmate accessible area cameras enclosures must be abuse or vandal resistant.

B. All camera installations shall be securely attached to mounting surface. Use lead shields or steel push anchors on solid masonry, wood screws for wood, toggle bolts for hollow masonry, and machine bolts for steel. Exposed fasteners will be torx pin reject security screws. All anchoring devices shall be rated to support not less than five times the total equipment weight.

C. In exterior applications the housing shall be fully weather proofed and the heater shall have sufficient power to keep snow, ice and condensation build-up from interfering with the line of sight. If the heater supplied as an integral part of the housing assembly is not of sufficient power to accomplish the above, provide a second heater with thermostatic control. Heaters and Pan Tilt Zoom power are not to be sourced via POE. They must be connected to separate voltage source and connected to UPS and emergency power. Pan Tilt Zoom signal shall may be powered over POE if it and camera power are within the POE voltage and amperage limits per port calculated for voltage drop over distance.

D. All cameras shall be UL listed.

2.2 INTERIOR/EXTERIOR FIXED POSITION CAMERAS

A. CCTV cameras shall be UL listed and shall be the standard product of Axis, Hanwha Techwin (Samsung), Vicon, or Bosch complying with not less than the specifications contained herein. Installation of each camera shall include mounting brackets and/or camera housings fully compatible with the camera provided.

B. Interior fixed cameras shall be integral dome assemblies surface ceiling, wall or corner mounted. Pendent mounting or bracket mounting may be utilized as required where compatible ceilings do not exist or to provide desired sight lines. Domes shall be similar to interior pan/tilt domes, camera shall be as follows:
1. Color, solid state charge coupled device 1/3-inch format.
2. Resolution for interior fixed and PTZ cameras – 2.0 MP: 1080p, 1900x1080 pixels, 30 IPS/FPS, 16:9 format.
3. Resolution – for exterior PTZ camera:, 2MP: 1080 TVL minimum, 1920x1080 pixels, 30 IPS/FPS, 16:9 format
4. Direct RJ45 network connection
5. Compression at the camera using H.265 compression
6. Individually configurable multi-streaming outputs up to native resolution satisfy all video viewing and recording requirements
7. Power Over Ethernet (POE) for camera – PTZ/Heater 12-24VDC or 12-24VAC
8. Provide video motion detection and masking/blurring analytics at the camera

9. Provide cameras with Video Analytics capability at the camera (video analytics not required to be activated and licensed unless otherwise noted).
    a. Idle Object
    b. Removed Object
    c. Multiple crossings
    d. Objects in the field of view
    e. Loitering
    f. Condition change
    g. Route Following
    h. Tampering
    i. Entering field
    j. Leaving field
10. Video Motion Detection, masking/blurring analytics and camera operation software license shall be included and shall be perpetual.
11. Video Analytics software license shall be optional and, if elected, shall be perpetual.
12. Minimum two user configurable video masking areas
13. Remote vari-focal (focal length and focus) control.
14. Provides internal character generation
15. Provides alarm input and output. Input is capable of displaying a user defined message, output can be NO or NC and respond to external input, video motion or video loss – user selectable.
16. Scene illumination required for full video with f/1.2 lens and 75% reflective surface 0.08 fc.
17. Wide Dynamic Range - 120 dB.
18. Automatic light range with f/1.4 to f/360 auto iris lens 1 million to 1.
19. Video Output 1.0 V p p, 75 ohm composite for service monitor.
20. Network: 10Base-T, 100Base-T, RJ-45
21. Lens – Varifocal lenses sized for the specific location and shot, auto iris control. Horizontal FOV to be 25 – 100 degrees minimum
22. Operating temperature range – minus 14 to 122 degrees F.
23. Operating humidity range 0 to 90% relative noncondensing.
24. Audio 1 line in, 1 line out, SNR >50dB
25. Dark Tint dome interior, clear dome exterior
26. Concealed wiring
27. Dome – Smoked polycarbonate interior – Clear in low light areas

2.3 INTERIOR/EXTERIOR PAN TILT ZOOM DOME CAMERAS

A. All interior/exterior Pan Tilt Zoom cameras shall be an integral dome assembly. The assembly shall be either pendent, wall, corner, post or semi-flush ceiling mounted as appropriate to the location.

B. The dome camera assembly shall conform to the requirements of 2.2 INTERIOR/EXTERIOR FIXED POSITION CAMERAS paragraph B, and the following specifications.
    1. AGC, 30 dB
    2. Lens, 1/3 inch, f/1.8, 30X optical zoom.
    3. Pan Range, 0 to 360 degrees continuous.
    4. The variable speed /high speed pan/tilt dome drive unit shall meet or exceed the following design and performance specifications.
        a. Vertical Tilt, Unobstructed tilt of +2 to -92 degrees – auto-flip image when crossing 92 degrees tilt.
        b. Pan speed, Variable between 400 degrees per second continuous to 0.1 degree per second.

c. Manual Control Speed, Pan speed of 0.1 degree to 80 degree per second, and pan at 150 degree per second in turbo mode. Tilt operation shall range from 0.1 degree to 40 degree per second.
d. Automatic Preset Speed, Pan speed of 400 degrees and tilt speed of 200 degrees per second.

5. Integral receiver fully compatible with control system.
6. Integral blower, thermostat, and heater assemblies for exterior cameras.
7. Minimum of 4 motion presets for alarm inputs.
8. Day/Night function
9. Presets only changeable by administrative level authorization.

2.4 CAMERA HOUSING AND SUPPORTS

A. All camera housings and support brackets shall be compatible with VSS camera specified to be installed within housings and/or mounted on brackets. Housings shall be provided with all cable entrance facilities for camera control and shall be adaptable to mounting devices used with cameras. If fisheye lenses are required to be used on cameras the housing shall not block view of lens.

2.5 CAMERA MOTION CONTROL

A. At all work stations camera pan and tilt control shall be accomplished via the touch-screen control stations and provide proportional movement (on touchscreens), by mouse movement on non-touchscreen monitors and by the VSS manufacturer's standard joystick selector controller.

B. At remote control locations the motion controller will "follow" selected image.

2.6 VSS MONITORS

A. VSS monitors shall be the standard products of VSS manufacturer - Hanwha Techwin (Samsung), Vicon, or Bosch compatible with the total system specified herein and complying with these specifications.

B. VSS monitors shall be liquid crystal display type, mounted as specified herein. Monitor controls shall be on off, brightness, contrast, vertical hold, and horizontal hold. Monitors shall contain differential input amplifier, voltage regulation and shall be rated for continuous duty. All monitors shall be UL listed.

C. Monitors for the Surveillance VSS system shall be color and sized as required in these specifications unless otherwise indicated on the drawings. These monitors shall conform to the following:
1. Size: as indicated in the plans, TFT, LCD active matrix
2. Power Source: 120 VAC, 60 Hz
3. Resolution 1920x1080 at 60 Hz
4. Video: Connections compatible with the system components.
5. Front panel control for color, tint, brightness, contrast
6. Geometric distortion less than 3%

D. Provide surface stand mount kits for installation at millwork where indicated.

2.7 VIDEO WIRING SYSTEMS

A. At existing camera locations, use IP over coaxial adapter modules at the camera and coaxial data switches at the head end – NVT Phybridge EC Link modules and CLEER 24 coaxial data

switches or equal. Replace all existing BNC connectors at both ends of coaxial cable. Test the existing cable for shorts to ground, shorts between center conductor and shield and continuity – provide test data to architect/engineer immediately upon completion of testing and prior to device installation. Use only 3 piece BNC crimp on connectors appropriate to the type and gauge of the existing coaxial cable.

B. At new cameras video cable shall be CAT 6 data cable and devices complying with EIA/TIA standards. All CAT 6 cabling and ports for the VSS system will be yellow in color and be run in raceway system as exists or as specified.

C. Motion control signal cable shall be as specified by the camera manufacturer and shall be compatible with the Recording and Control System. All cabling shall be in concealed conduit system or in cable tray system. Cables shall have outer jacket and shall be suitable for either direct burial, installation in concrete encased ductbank, in cable tray system or in conduit system.

D. Protect all communication and data equipment induced on all control, sensor video, and data cables. All cables and conductors which exit the building envelope and serve as control, sensor video or data conductors shall have surge protection circuits installed at each end that meet the IEEE472 surge withstand capability test and the electrical transient tests as established in UL365. Fuses shall not be used for surge protection.

E. Where not contained within the camera housing, control and signal cables for pan-tilt-zoom cameras shall be coiled from junction box to camera housing. Coiled cables shall not exceed 150 mm in length.

F. Raceway system shall be sized by the Systems Integrator to allow all video cables to be installed as required by the cable manufacturer for pulling tension and bending rations for cable. Under no conditions shall cable exceed 40-% fill of conduit system.

2.8 CAMERA LENSES

A. Camera lenses shall be varifocal and be compatible with camera construction and iris control circuit. The lenses shall be compatible with remote control devices as specified herein. The lenses will be remote adjustable for focal length and focus. The lenses shall be supplied by the camera manufacturer.

B. All lenses shall be auto iris type driven by the camera iris control circuit. Additionally, all exterior lenses shall be equipped with spot filters giving the lens a minimum effective aperture of f/360.

C. All exterior Pan-Tilt-Zoom cameras shall be equipped with 30X optical zoom, f/1.9 lenses based upon desired scene field of view.

D. Interior Pan-Tilt-Zoom Dome camera shall be similarly equipped with 10X optical zoom, f/1.8 lens.

E. At the time of shop drawing submittals, provide a schedule of lenses for each camera, which includes the angle of view. Pick lenses for interior cameras based on the door or scene covered. Expect adjustments to the lens selection.

F. Cameras in elevators and sally ports shall be equipped with wide angle lens (100 degrees or greater) and installed in vandal resistant corner-mount “elevator” style housings.

2.9 NETWORK ATTACHED STORAGE

A. All VSS equipment shall be networked together through a separate network dedicated to the VSS. The VSS network and security network shall be VLAN connected for interface between the systems.

B. The digital and network recorders shall be multiple rack mounted computers installed in racks in the security equipment rooms.
1. Network Attached Storage shall be RAID-5 array devices.
2. Network Attached Storage shall be sized to suit number of cameras and recording requirements for cameras and encoders at each location.
3. Network Attached Storage may function as video server or as storage attached to separate video server/appliance.
4. Network Attached Storage shall have redundant fans and power supplies.
5. All equipment shall be connected to UPS.
6. All equipment shall be IP based and communicate via CAT 6 RJ45 connection to the dedicated network for the VSS system.
7. Transfer of video to DVD or other storage media shall not reduce the quality of the image. Transfer protocol must be provided that will authenticate video for use as evidence in a court of law. The system shall not allow tampering with video images so that originated video can be confirmed as authentic original. Equipment required to review and transfer video will be provided at the head-end equipment rack.
8. The Network Attached Storage shall have loss of video detection for each camera. The system shall alert the Master Control Stations of any equipment or network malfunctions.
9. The Network Attached Storage shall have the ability to change recording date, cameras to be recorded, time of recording, etc.
10. Frame rate shall be 7.5 frames per second, recording at 2MP, with the highest quality setting, and recording resolution shall be adjustable via the video management system as well as be event driven. Net storage of the RAID 5 array must be calculated to allow 30 days storage assuming 70% motion. Provide calculations of video storage sizing with shop drawings submittal.
11. The Network Attached Storage shall be capable of recording audio either from the camera via the network or as a direct connection from the source. The source may be a single microphone, line amplifier, or mixer depending on the distance from the recorder and the number of microphones connected to a single recording input. The impedance shall be matched with the source and the input shall provide automatic gain qualities.

2.10 VSS WORK STATION CPU

A. VSS Work Station CPU will comply with the following minimum requirements or manufacturer’s recommendations whichever is greater:
1. Windows 10 Professional 64 Bit Operating System
2. Eight Gigabytes RAM
3. SATA 3, 1TB Hard Drive
4. 1 Gigabyte Video card sufficient to feed up to 4 video monitors at native resolution
5. Intel Quad Core, eight thread, I7 processor
6. Under counter mount kit

2.11 VIDEO NETWORK SWITCH

A. The VSS system shall be hybrid coaxial and CAT 6 network. Utilize existing coaxial cable and coaxial data switches at existing camera locations. Use CAT 6 networking cable and managed data switches at new camera locations. The VSS CAT 6 network will be interfaced with the administrative facility network. The Owner will establish a VLAN for IP-CCTV camera system traffic on their network. The contractor will coordinate with the owner to establish the VSS

network. The contractor will supply CAT 6 network data switches for VSS network connections except as required to connect to the owner's network. Some existing CCTV workstation locations traverse the owner's administrative network – they will be migrated to the VSS VLAN network but remain on the owner's physical network.

B. The VSS system network will be connected to field devices at Security Equipment room SEC1 (SE 1041) dedicated capable of Gigabit (1000 Mbps) speed. The VSS system network will be an isolated network. Isolation will be via VLAN. Except as allowed and provided for by the owner, the VSS network will not be allowed to connect to any other network nor to any internet source.

C. The VSS network shall have the capability through extension of the IP CCTV network to send network video to a standard administrative computer with manufacturer's client/server software. Access to the VSS video will be limited to the computer with the IP CCTV network connection and client/server or browser based software and will be password protection on the desk machine. The software will enable video source selection, including live and archived video, without interfering with normal VSS operations. Licensing fees will be included for up to 4 connections simultaneously and will be perpetual. If additional NIC card is required to meet these requirements, the contractor will provide and install the NIC card coordinating with the owner's IT staff.

D. Network Switch devices on the VSS system shall be capable of routing live or archived video and video control via the VSS network without a loss of quality, resolution or speed. The Network switch shall be as follows:
1. Level 3, IP Based, Managed switch
2. Multicast capable
3. Stackable
4. Produce 10/100/1000 at each port simultaneously – minimum 8 ports, maximum 48 port devices
5. Have redundant power supplies
6. Have gigabit, wire speed backplane
7. Have POE+ 800 Watt at 48 port unit, 400 Watt at 24 port unit

2.12 VIDEO MANAGEMENT SYSTEM

A. The Video Management System (VMS) shall be centrally located at the SEC1 (SE 1041). It shall be 19" rack mounted unit of the VSS manufacturer or rack mounted server per VSS manufacturer's specifications and VSS manufacturer's VMS software. All software licenses shall be included and shall be perpetual. VMS Software of GENETEC, ONSSI and MILESTONE are acceptable alternatives to the VSS Manufacturer's product. The SI must select software capable of meeting the performance requirements of these specifications. SI must include all licensing costs for all the project cameras plus the 20% spare capacity and the license must be perpetual.

B. The Video Management System shall:
1. Be the product of the VSS system manufacturer or recommended and supported by the VSS system manufacturer. The VMS appliance/server must contain a gigabit network adapter.
2. Be designed and programmed to balance video storage and retrieval among all video storage resources on the network – responding to demand use or re-routing video in the event of a storage device failure.
3. Support simultaneous viewing of video from multiple cameras and sources.
4. Manage video events sourced from within the VSS system and triggers from within the system and from other systems, notably the Security Monitoring and Control system, Card Access system and the Intercom and Public Address system.

5. Perform camera administration and management – take advantage of intelligence and functionality at the camera to reduce the administration and management workload of the VMS.
6. Program VSS video sources for constant or alarmed recording, base frame rate, frame rate on alarm, quality, compression and resolution of recording on each stream of camera output. The recording parameters shall be time and date customizable.
7. Coordinate VSS components for viewing, listening and recording of video and audio sources from multiple locations simultaneously
8. Support multi-camera playback at multiple locations simultaneously.
9. Support VSS video source firmware upgrades by group or individually
10. Manage user access rights to VSS system features.
11. Provide system activity data and reporting capability.
12. Support web based intranet access to system live and recorded video and VSS components.
13. Be scalable for future VSS expansion of up to 100%.
14. Manage Video Motion detection setup and settings for VSS cameras.
15. Be capable of event responses based upon programming to include, automatic uploading of images, activating camera output ports, sending e-mail, text or HTTP/TCP notifications, signal PTZ to go to a preset, activate audio systems, communicate to the Security Monitoring and Control system for specific action(s), provide customizable screen messages or operator instructions.
16. The VMS software shall be licensed in the name of the owner and shall be perpetual. All passwords and software documentation will be turned over to the owner upon final inspection.

2.13 VIDEO VIEWING AND ARCHIVING STATIONS (not used)

2.14 EXTERIOR POLES FOR CAMERA MOUNTING – see project plans.

2.15 AUDIO EQUIPMENT FOR VIDEO/AUDIO EQUIPMENT

A. The microphones shall be either condenser or dynamic type. Boundary layer type microphones may be utilized. The coverage pattern shall be selected to provide the optimum reception at the installed location. The frequency response of the microphone shall be optimal to recording the human voice. The output shall be balanced-low impedance. The microphones may be either ceiling, wall, or desk mounted per plans. Ceiling and wall mountings shall be mechanically isolated from structure vibrations and shall not extend farther than one inch from the surface of the ceiling or wall. Provide built in pre-amp to produce line level audio output. Provide Louroe Verifact A LE-070 or equal. Where microphones are installed in inmate accessible spaces they shall be of rugged construction or be protected from damage.

B. Where conditions exist that multiple microphone locations are covered by a single camera, provide passive mixing equipment to combine the various microphone signals into a single signal. Provide Louroe MLA series mixer or equal.

C. Provide line amplifying equipment as required to insure sufficient signal level arrives at the recorder(s).

2.16 FLEXIBLE MONITOR MOUNT

A. Flexible Monitor Mounts in the style indicated in the plans shall be provided for both touch-screen monitors and VSS monitors in Master Control and Sub-Control rooms except where monitor troughs are provided in the millwork.

B. Where applicable, the mount shall bolt to the work surface in a location to provide adjustments for sitting and standing positions with-in easy reach of the operator.

C. The monitor shall be movable by grasping the monitor and moving it to the desired location. Mounts requiring un-locking or turning of knobs or levers are not acceptable.

D. Mount shall be equipped with VESA mounting plates sized to match the monitor's requirements.

E. Where required to be articulating, the mount shall adjust a minimum of 18 inches in the vertical direction and 27 inches horizontally. The mount shall allow for at least 180 degree rotation of the monitor both horizontally and vertically without requiring the mounting arms to change direction.

2.17 VIDEO ENCODER (not used)

2.18 ETHERNET OVER COAX DEVICE

A. Provide Ethernet over coax media changer adapters (modules) at existing camera locations.
   1. The module must be small form factor (be able to be installed in a standard double gang box).
   2. Provides for the transmission of 30W POE power to the camera via the VSS switch and coaxial cabling. Transmission of POE power will be via 2 pair of the RJ45 connector – always on.
   3. Compatible with 75 ohm impedance coaxial cabling.
   4. Interfaces
      a. 1 each RJ45 (8P8C) connector for IP device
      b. 1 each BNC jack for coaxial cable
   5. Supports 10/100 Base T transmission rates, auto-negotiation
   6. Based on the type of coaxial 75 ohm cable in use, maximum range of circuit length is 1500' to 4000'.
   7. Maximum data through-put is 200Mbps (total up and down combined).
   8. Contains two status indicators – green for link status, amber for link activity.
   9. Capable of utilizing local power.
   10. NVT Phybridge EC-Link or equal.

B. Provide Ethernet over coax media changer data switch.
   1. Enterprise grade 28 port managed data switch
   2. Provides up to 24 BNC male coaxial data ports (media changer internal to the switch) and four RJ45 data ports.
   3. Provides 30W POE power to edge devices via coaxial cable and media changer adapter.
   4. Compatible with 75 ohm impedance coaxial cabling.
   5. Interfaces
      a. 4 each RJ45 ports for CAT 6 cable
      b. 24 each BNC jacks for coaxial cable
   6. Supports 10/100 Base T transmission rates, auto-negotiation
   7. Based on the type of coaxial 75 ohm cable in use, maximum range of circuit length is 1500' to 4000'.
   8. Maximum data through-put is 200Mbps (total up and down combined).
   9. Contains two status indicators per port – green for link status, amber for link activity.
   10. Hot swappable power supply Unit.
   11. NVT Phybridge CLEER24 or equal

2.19 SPARE PARTS

A. Provide one each interior fixed dome camera of the same make and model as provided and approved for this project as a spare part. Turn over to the owner at project close-out. Include in the training requirement (See 017720, 280000 3.2) the process for setting up the spare camera for use at the location of a failed unit.
B. Provide 10 each single line media changer adapters.
C. Provide 5 of each type of Surge Protection device utilized for the project.

PART 3 - EXECUTION

3.1 EQUIPMENT

A. Mount exterior cameras to building and poles where noted. Base, supports, and grounding shall be installed as detailed in the drawings and in accordance with manufacturer's literature and in compliance with the Electrical Code.

3.2 WIRING

A. All system wiring shall be installed in concealed conduit. Wiring for exterior pole mounted cameras shall be routed inside with strain relief connectors. Provide lightning (surge) protection devices at camera locations for all copper conductors. Also provide lightning (surge) protection devices on copper signal and power conductors where they enter or depart the building envelope. Provide lightning protection aerial on top of all poles and connected to ground rods system with a #6 AWG solid copper conductor. All underground, in slab or under slab wiring shall be rated for wet applications.

END OF SECTION