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PROJECT MANUAL / TECHNICAL SPECIFICATIONS

**WEST GATE ENTRANCE EXTERIOR IMPROVEMENTS  
BEXAR COUNTY ARENAS - FENCING PACKAGE**

3201 E. HOUSTON STREET  
SAN ANTONIO, TEXAS 78219

OCTOBER 6, 2017

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Bexar County Arenas

PROJECT ADDRESS: 3201 E. Houston St.  
San Antonio, Texas 78219

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SECTION 010000 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 LAYING OUT THE WORK

- A. Dimensions and elevations indicated in layout of work shall be field verified by the Contractor.
- B. Discrepancies between Drawings, Specifications and existing conditions shall be referred to the Architect for adjustment before work affected is performed. Failure to make such notification shall place responsibility upon the Contractor to carry out the work in a satisfactory, workmanlike manner and without additional cost to the Owner.
- C. The Contractor shall be held responsible for the location and elevation of all the work shown on the Construction Documents.
- D. Prior to ordering any materials or commencing work, the Contractor shall carefully compare and check all sheets of Drawings, each with the other that in any way affects the location or elevation of the work to be executed by him, and should any discrepancy be found, he shall immediately report the same to the Architect for verification and adjustment. Any duplication of work made necessary by failure or neglect on the Contractor's part to comply with this requirement shall be performed at the Contractor's sole expense.
- E. Prior to commencing the Work, Contractor shall layout the entire fence line, including gates, utilizing chalk lines on existing asphalt paving surface for the Owner's final review and approval.

1.3 SUPERINTENDENT

- A. A competent Project Manager and Superintendent satisfactory to the Architect and the Owner shall be exclusively on the Job full-time from the beginning of the Job until its final acceptance, regardless of the work that is in progress; and said Project Manager or Superintendent shall have the authority to act for the Contractor.

1.4 TEMPORARY CONSTRUCTION AND FACILITIES

- A. The Contractor shall furnish, erect and maintain for the duration of the Contract, all scaffolds, platforms and similar temporary construction and facilities as may be necessary for the performance of the Contract. Such facilities shall be of a type and arrangement as required for their specific use shall be substantially constructed, strongly supported, properly secured and shall comply with all applicable rules and regulations of Federal, State and local codes.

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1. Open shafts, holes, pits, etc. shall be enclosed as required by the Texas Department of Public Safety and shall comply with all requirements established by the Occupational Safety and Health Administration (OSHA).

1.5 TIME FOR COMPLETION AND PAYMENTS

- A. Time is of the essence for this Contract; and the work to be performed under the General Contract shall commence within seven (7) calendar days of receipt of notice to proceed; and shall be substantially completed on or before the time stipulated in Contract.

1.6 PERMITS AND FEES

- A. Contractor shall verify with all authorities having jurisdiction and with public utilities on the requirements of permits and fees that are applicable to this Project including the use of areas outside of property lines for construction operations. Contractor shall apply for, obtain and pay for all permits and fees required in the performance of the work of this Contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:

- 1. New painted metal fencing panels set between plaster / masonry pillars on new concrete footings and related gates.
- 2. Work covered by Contract Documents.
- 3. Access to Site.
- 4. Coordination with Owner and occupants.
- 5. Work restrictions.
- 6. Specifications and drawing conventions.

- B. Related Section:

- 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: West Gate Entrance Exterior Improvements / Bexar County Arenas - Fencing Package

- 1. Project Location: 3201 E. Houston Street, San Antonio, Tx 78219

- B. Owner: Bexar County, Texas

- 1. Owner's Representative: as designated by Owner.

- C. Architect of Record: H. Saldana & Associates

- D. Other Consultants: The following design professionals have prepared designated portions of the Contract Documents:

- 1. Robert Martinez - Structural Engineer

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1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of the Project is defined by the Contract Documents and includes, but is not limited, to the following:
  - 1. Demolition of existing chain-link fencing, existing concrete footings and related site components, including the removal of portions of existing asphalt paving at new concrete footing locations, as well as, all other items indicated in Drawings.
  - 2. New painted metal fencing panels set between masonry / plaster pillars on new concrete footings.
  - 3. New asphalt paving patching work at new concrete footing locations

1.5 TYPE OF CONTRACT

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

1.6 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to areas within the Contract limits. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Limits: Confine construction operations to Contract Limits.
  - 2. Driveways, Walkways and Entrances: Keep driveways, parking areas, loading areas and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner's personnel and general public will occupy the areas of site immediately adjacent to project site during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations.
  - 1. Maintain access to existing adjacent occupied or used facilities. Do not close or obstruct walkways or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
  - 2. Notify the Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to

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Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Obtain a Certificate of Occupancy from authorities having jurisdiction prior to limited Owner occupancy.
2. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, required tests and inspections shall be successfully completed and a Certificate of Occupancy, duly-issued by local authorities, shall be obtained by the Contractor. Upon occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
3. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
4. Upon occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  1. Comply with limitations on use of public streets and other requirements of as established by authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to normal business working hours of 7 a.m. to 4 p.m., Monday through Friday, except as otherwise indicated.
  1. Weekend Hours: As pre-approved by Owner.
  3. Early Morning Hours: As pre-approved by Owner.
  4. Hours for Utility Shutdowns: As pre-approved by Owner.
- E. Existing Utility Interruptions: Do not interrupt utilities serving existing facility unless permitted under the following conditions; and then only after providing temporary utility services according to requirements indicated.
  1. Notify Owner not less than three (3) days in advance of proposed utility interruptions.
  2. Obtain Owner's written permission before proceeding with utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruptions.
  1. Notify Owner not less than three (3) days in advance of proposed disruptive operations.
  2. Obtain Owner's written permission before proceeding with disruptive operations.
- D. Nonsmoking Facility: Smoking is not permitted within 25 feet (8 m) of entrances or outdoor air intakes.
- E. Controlled Substances: Use of tobacco products and other controlled substances on the Project Site is not permitted.



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- F. Employee Identification: Provide identification tags for Contractor personnel working on the Project site. Require construction personnel to wear identification tags at all times.
- G. Employee Screening: Comply with Owner's requirements regarding drug and background screening of Contractor personnel working on the Project site.
  - 1. Maintain list of approved screened personnel with Owner's Representative.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. 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. Imperative mood and streamlined language are generally used in the Specifications. 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.
  - 2. All specification requirements are to be fully-complied with and performed by Contractor.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and defined on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 2 - EXECUTION (Not Used)

END OF SECTION

SECTION 011500 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 LAYING OUT THE WORK

- A. Dimensions and elevations indicated in layout of work shall be field verified by the Contractor. Engage the services of land surveyor certifying the location and elevation of all new fencing and related elements.
- B. Discrepancies between Drawings, Specifications and existing conditions shall be referred to the Architect for adjustment before work affected is performed. Failure to make such notification shall place responsibility upon the Contractor to carry out the work in a satisfactory, workmanlike manner and without additional cost to the Owner.
- C. The Contractor shall be held responsible for the location and elevation of all the work shown on the Construction Documents.
- D. Prior to ordering any materials or commencing work, the Contractor shall carefully compare and check all sheets of Drawings, each with the other that in any way affects the location or elevation of the work to be executed by him, and should any discrepancy be found, he shall immediately report the same to the Architect for verification and adjustment. Any duplication of work made necessary by failure or neglect on the Contractor's part to comply with this requirement shall be performed at the Contractor's sole expense.
- E. Prior to commencing the Work, Contractor's surveyor shall layout the entire fence line, including gates, utilizing chalk lines on existing concrete or asphalt-paved surfaces for the Owner's final review and approval.

1.3 SUBMITTALS

- A. Certificates: Submit a certificate signed by the land surveyor certifying the locations and elevations of improvements.
- B. Project Record Documents: Submit record of Work performed and record survey data as required by under provisions of Project Closeout Section.

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1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: Engage a land surveyor registered in the State of Texas to perform required land-surveying services.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify layout information shown in the Drawings, in relation to existing benchmarks. Locate and protect existing bench marks and control points as found on the Owner's property survey. Establish additional benchmarks as required for the proper layout of the Work. Preserve existing and new benchmarks during construction.
- B. Establish and maintain a minimum of 2 permanent benchmarks on the Project Site, referenced to data established by benchmarks on the Owner's property survey.
  - 1. Record benchmark locations on Project Record Documents.
- C. Existing Utilities: Before beginning the Work of this Contract, investigate and verify the existence and location of underground utilities and other construction. Request copies of documents containing information regarding existing utilities from the Owner. The existence and location of existing underground utilities are not guaranteed. Furnish information necessary to adjust, move or relocate existing utilities lines located in the area of construction as required to accommodate the Work of this Contract.

END OF SECTION

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

- B. Related Sections:

- 1. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Submittals: Written and graphic information and physical samples that require Architect's responsive action. Submittals are those identified in individual Specification Sections as submittals.

1.4 SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- 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.

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2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. 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.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
  4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
  5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- C. Identification and Information: Place a permanent label or title block on each paper copy submittal item 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 on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
- D. Submittal Paper Copies: Six (6) paper (hand) copies to Architect are required for each submittal.
1. Submit one copy of submittal to each concurrent reviewer in addition to specified number of copies to Architect.
- E. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
- F. 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.

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3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- G. Distribution: Furnish copies of submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- H. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  1. Submittals: Submit six paper copies of each submittal. Architect will return four copies.
  2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
  3. 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 notarized statement on original paper copy certificates and certifications where indicated.
  4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- 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 published 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. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.

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- f. Application of testing agency labels and seals.
  - g. Notation of coordination requirements.
  - h. Availability and delivery time information.
- 4. Submit Product Data before or concurrent with Samples.
  - 5. Submit Product Data in the following format:
    - a. Six paper copies of Product Data. Architect will return four copies.
- 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.
  - 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 42 inches (750 by 1067 mm).
  - 3. Submit Shop Drawings in the following format:
    - a. Six opaque copies of each submittal. Architect will retain two copies; remainder will be returned.
- 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.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.
- G. Installer Certificates: Submit 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.
- H. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- I. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- J. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

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- K. Material Test Reports: Submit 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.
- L. Product Test Reports: Submit 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.
- M. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- N. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- O. Field Test Reports: Submit reports 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.

### PART 3 - EXECUTION

#### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: 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 Contractor's approval stamp before submitting to Architect..
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Contractor's 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 thoroughly reviewed, checked, and approved for compliance with the Contract Documents.

#### 3.2 ARCHITECT'S ACTION

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



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- C. Partial submittals will not be accepted.
- D. Incomplete submittals are not acceptable and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. 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.

C. Related Sections:

- 1. Divisions 02 through 32 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 constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

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- E. 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 authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. 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.
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: 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 conflicting 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.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.

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- D. Testing Agency Qualifications: 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.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices,

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receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. 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.
- C. 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.
- D. 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.
- 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 Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329 and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. 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.

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- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods.
- K. 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:

1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  - 3. Costs for re-testing and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
- C. Manufacturer's Field Services: 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 01 Section "Submittal Procedures."
- D. Manufacturer's Technical Services: Engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

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4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses. .
- 1.10 SPECIAL TESTS AND INSPECTIONS
- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction.
- B. Special Tests and Inspections shall be conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections.

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.
- 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 014100 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Selection and payment.
- B. Contractor submittals.
- C. Laboratory responsibilities.
- D. Laboratory reports.
- E. Limits on testing laboratory authority.
- F. Contractor responsibilities.

1.2 RELATED SECTIONS

- A. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

- A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ANSI/ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.4 SELECTION AND PAYMENT

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Costs for re-testing shall be paid by Contractor. See Subsection 1.9 of this Section.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.
- B. Laboratory: Authorized to operate in the State of Texas and accredited by the American Association of Laboratory Accreditation (A2LA).
- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) standards or accepted values of natural physical constants.

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1.6 LABORATORY RESPONSIBILITIES

- A. Test samples materials provided by Contractor.
- B. Provide qualified, trained personnel at site. Cooperate with Architect and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings appropriate to phase of work.

1.7 LABORATORY REPORTS

- A. After each inspection and test, promptly submit three copies of laboratory report to Architect, and two copies to Contractor.
- B. Report is to include:
  - 1. Date issued,
  - 2. Project title and number,
  - 3. Name of inspector,
  - 4. Date and time of sampling or inspection,
  - 5. Identification of product and Specifications Section,
  - 6. Location materials being sampled and tested were placed in the Project,
  - 7. Type of inspection or test,
  - 8. Date of test,
  - 9. Results of tests,
  - 10. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.8 LIMITS ON TESTING LABORATORY AUTHORITY

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- A. Laboratory may not:
  - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Approve or accept any portion of the Work.
  - 3. Assume any duties of Contractor.
- B. Laboratory has no authority to stop the Work.

1.9 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, including proposed concrete, mortar, grout, plaster, stucco and other mix designs.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- D. Notify laboratory not less than 24 hours prior to expected time for operations requiring inspection and testing services.
- E. Employ services of a separate qualified testing laboratory or contract with laboratory and pay for:
  - 1. Review of trench and excavation safety program and inspect its implementation.
  - 2. Additional samples and tests required by Contractor beyond specified requirements.
- F. Pay costs of re-testing when original tests indicate material tested fails to meet specified requirements. Cost for re-testing and inspections occasioned thereby will be deducted from the Contract Sum.
- G. Pay cost for additional testing when originally specified tests were not conducted timely due to failure of the Contractor to provide laboratory adequate advance notice to schedule personnel. Cost for additional tests and inspections occasioned thereby will be deducted from the Contract Sum.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 014210 - ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The work covered by this Section consists of furnishing all labor, materials and equipment as required for the prevention of environmental pollution during and as a result of construction operations under this Contract. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents, which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and recreational purposes. The control of environmental pollution requires consideration of air, water and land, and involves noise control and management of solid waste, as well as other pollutants.

1.2 APPLICABLE REGULATIONS

- A. In order to prevent, and to provide for abatement and control of any environmental pollution arising from the construction activities of the Contractor and his subcontractors in the performance of this Contract, they shall comply with all applicable federal, state and local laws and regulations concerning environmental pollution control and abatement, as well as the specified requirements stated elsewhere in the Contract Specifications.

1.3 PROTECTION OF LAND RESOURCES

- A. General: It is intended that all areas within the Contract Limits and outside the limits of permanent work performed under this Contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the Project. The Contractor shall confine his construction activities to areas within Contract Limits as indicated in the Drawings.
- B. Post-Construction Cleanup: The Contractor shall remove all signs of temporary construction facilities, stockpiles of waste materials, or any other vestiges of construction within the work area. No additional payment will be made for post-construction cleanup. All cleanup costs shall be borne by the Contractor.

1.4 DUST CONTROL

- A. The Contractor will be required to minimize dusty conditions resulting from new concrete footing excavation work.

1.5 ADDITIONAL ENVIRONMENTAL REQUIREMENTS

- A. Restrictions:

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1. At no time will equipment or construction materials which include polychlorinated bi-phenyls (PCBs) be used in the Work. Contractor shall provide Owner with a notarized affidavit stating that no such materials were incorporated into the Work.
  2. Without exception, lead-based paints will not be used in the Work. Contractor shall provide Owner with a notarized affidavit stating that no such materials were incorporated into the Work.
  3. No asbestos-containing building materials will be used in the Work. Contractor shall provide Owner with a notarized affidavit stating that no such materials were incorporated into the Work.
- B. Refer to Section 017419 for additional construction waste management and disposal requirements.

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 and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections:
  - 1. Division 01 Section "Summary" for work restrictions and limitations.

1.3 TEMPORARY UTILITIES

- A. General: Contractor will be allowed access to and temporary use of the Owner's permanent water and electric power sources for the performance of the Work of this Contract on the condition that the Contractor adhere to energy and water conservation measures. Separate metering for temporary water and electric service is not required.
- B. Water Service: Contractor will be allowed access to Owner's permanent water service as required in the performance of the Work.
- C. Electric Power Service: Contractor will be allowed the use of the Owner's permanent electric power service as required in the performance of the Work.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.
- C. Dust-Control Plan: Submit coordination drawing and narrative that indicates the dust-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate.

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1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Electric service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines, ICC/ANSI A117.1 and TAS.

PART 2 - PRODUCTS

2.1 MATERIALS FOR TEMPORARY FACILITIES

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 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.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils (0.25 mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
- C. Sanitary Facilities: Provide portable toilet and wash facilities for use by construction personnel. Provide self-contained, portable, single-occupant toilet units of chemical, aerated type, properly-vented and fully-enclosed with a glass-fiber-reinforced polyester shell or similar non- absorbent material. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used materials.
- D. Drinking-water Fixtures: Provide portable drinking-water dispensers, including paper cup supply.

2.3 EQUIPMENT

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

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: Connect to Owner's permanent existing services for temporary water and electric power as required to perform the Work of this Contract. Contractor will be allowed access to and use of the Owner's permanent water and electric power sources for the performance of the Work of this Contract on the condition that the Contractor adhere to energy and water conservation measures.
  - 1. Arrange with Owner for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Contractor will be allowed access and use of the Owner's water source for temporary water service as required to perform the Work of this Contract. Clean and maintain water service facilities in a condition acceptable to Owner. Comply with requirements of authorities having jurisdiction.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Isolation of Work Areas in Occupied Facilities or Portions thereof: Prevent dust, fumes, and odors from entering occupied areas of adjacent facilities.
- E. Perform daily construction cleanup and final cleanup.
- F. Electric Power Service: Contractor will be allowed access to and use of the Owner's permanent electric power source for temporary electric service as required in the performance of the Work of this Contract. Contractor shall provide a distribution system of sufficient size, capacity, and power characteristics required for performance of construction operations.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
- H. Telephone Service: Provide temporary telephone service in the form of cellular telephones devices.



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1. Provide Project Manager, superintendent and other key personnel with cellular telephones.

### 3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Dewatering Facilities: Comply with requirements of authorities having jurisdiction. 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.

C. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

1. Comply with work restrictions specified in Division 01 Section "Summary."

B. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around elevator pits to prevent flooding by runoff of storm water from heavy rains.

C. Tree and Plant Protection: Comply with requirements as indicated in Drawings.

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- D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- E. Site Enclosure Fence (Construction Fence): Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from entering site except by entrance gates.
  - 1. Extent of Fence: As required by the progress of the Work.
  - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
  - 3. Modify and relocate enclosure fence as required by the progress of the Work.
- F. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- I. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.
  - 1. Construct covered walkways using scaffold or shoring framing.
  - 2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
  - 3. Paint and maintain appearance of walkway for duration of the Work.
- J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather-tight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- K. 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 construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

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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.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. 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 Substantial 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.

END OF SECTION

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

- 1. Installation of the Work.
- 2. Cutting and patching.
- 3. Layout of work / Field verification of dimensions.
- 4. Progress cleaning.
- 5. Checking and adjusting.
- 6. Protection of installed construction.
- 7. Correction of the Work.

- B. Related Sections:

- 1. Division 01 Section "Submittal Procedures" for submitting surveys.
- 2. Division 01 Section "Closeout Procedures" for submitting with Project Record Documents, a record of Owner-accepted deviations from Contract Documents.
- 3. Division 02 Section "Selective Demolition" for demolition and removal of existing fencing and other site-related components as indicated in Drawings.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to accommodate new work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of new work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor. Submit documentation showing that land surveyor is registered in the State of Texas to perform the required land-surveying services.

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- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 (ten) days prior to the time cutting and patching will be performed for architect's/engineer's review and approval. Include the following information:
  - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from the Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
  - 2. 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.
  - 3. Other Construction Elements: Do not cut and patch other construction elements or 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.
  - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction 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.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products.

1.6 WARRANTY

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

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PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground utilities within the area of construction are undetermined. Before beginning the work of this Contract, investigate and verify the existence and location of all existing underground utilities and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, 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.

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.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect.

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3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, field verify layout information shown on Drawings, in relation to 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 additional benchmarks and control points to set lines and levels at each section of fencing and elsewhere as needed to locate each element of Project.
  - 2. Field verify and establish dimensions as required to layout the Work. 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. Construction Lines and Levels: Locate and lay out control lines and levels for each element of the Work. Transfer survey markings and elevations for use with control lines and levels.
- D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. 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.
- E. Prior to commencing the Work, Contractor's surveyor shall layout the entire fence line, including gates, utilizing chalk lines on existing concrete and asphalt-paved surfaces for the Owner's final review and approval.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation..
  - 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.
- 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 Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

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- 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. Attachment: Provide attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
- 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.

### 3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. 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. Temporary Support: Provide temporary support of work to be cut.
- C. 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.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section "Summary."
- E. Existing Utility Services: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to adjacent areas.
- F. 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 neatly to minimum 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.



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3. Concrete and Masonry: 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 31 Sections where required by cutting and patching operations.
  5. Proceed with patching after construction operations requiring cutting are complete.
- G. 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 practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
- H. Cleaning: Clean areas where cutting and patching are performed.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. 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 waste materials more than seven days during normal weather or three 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.
  4. Coordinate progress cleaning in areas where more than one installer has worked.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Where dust would impair proper execution of the Work, broom-clean 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. Exposed Surfaces : Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- F. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

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- G. 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 at Substantial Completion.
- H. 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.
- I. 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.

3.7 CHECKING AND ADJUSTING

- A. Check gate components to confirm proper operation. Remove malfunctioning components and replace with new components, and re-check.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

3.9 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and pavements.
- B. Restore permanent facilities impacted by the new construction to their original condition.
- C. Remove and replace damaged components that are exposed to view if components cannot be repaired without visible evidence of repair.
- D. Repair gate components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace all damaged sections of fencing and gates.

END OF SECTION

SECTION 017400 - WARRANTIES

PART 1 - GENERAL

1.1 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.
  - 1. 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. Section 013300 - Submittals: Specifies procedures for submitting warranties.
  - 2. Section 017700 - Contract Closeout: Specifies contract closeout procedures.
  - 3. Note: See individual Specification Sections for specific requirements for warranties on products and installations specified to be warranted.
  - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty pursuant to the Contract Documents 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.

1.2 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 benefitted 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

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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.

1. 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.

E. 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.

1.3 SUBMITTALS

A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. 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.

C. Prepare a written document utilizing the 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.

1. Refer to individual Sections for specific content requirements and particular requirements for submitting special warranties.

D. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

E. 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 paper.

1. 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.

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2. 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: Provide warranties on products and installations as required by individual specified Sections.

END OF SECTION

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging non-hazardous demolition and construction waste.
  - 2. Recycling non-hazardous demolition and construction waste.
  - 3. Disposing of non-hazardous demolition and construction waste.
- B. Related Sections:
  - 1. Division 02 Section "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements and for disposition of hazardous waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

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1.4 PERFORMANCE REQUIREMENTS

- A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date of the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report.
- B. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them.
- C. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them.
- D. Qualification Data: For waste management coordinator.

1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of Projects with similar requirements.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification and waste reduction work. Distinguish between demolition and construction waste.
- B. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with streets, sidewalks, walkways and other adjacent occupied and used facilities.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Store components off the ground and protect from the weather.
  - 4. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING DEMOLITION WASTE

- A. Concrete Paving: Remove reinforcement and other metals from concrete and sort with other metals.
  - 1. Crush concrete and screen for use as fill or sub-base.



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- B. Asphaltic Concrete Paving: Break-up and transport to an asphalt-recycling facility.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: Require deliveries using pallets to remove pallets from Project site.
4. Crates: Break down crates into component wood pieces.

- B. Chain-Link Fencing: Remove and deliver to Owner for re-use elsewhere on Site.

- C. Masonry: Pulverize masonry to maximum 3/4" and screen for use as fill or sub-base.

- D. Metal joint reinforcement (for CMU): Transport waste material to re-cycling facility.

3.5 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

- B. Burning: Do not burn waste materials.

- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.

- B. Related Sections:

1. Division 01 Section "Execution" for progress cleaning of Project site.
2. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
3. Note: See individual Specification Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with 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.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, 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. Advise Owner's personnel of changeover in security provisions.
8. Terminate and remove temporary facilities from Project site.

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9. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
10. Complete final cleaning requirements, including touchup painting.
11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion 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. Results of completed inspection will form the basis of requirements for final completion.

#### 1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction 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.

#### 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization 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.

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1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
  - a. Project name.
  - b. Date.
  - c. Name of Architect.
  - d. Name of Contractor.
  - e. Page number.
4. Submit list of incomplete items in the following format:
  - a. Three paper copies of product schedule or list, unless otherwise indicated. Architect will return two copies.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark 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 Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

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PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by 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. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove debris from all adjacent areas.
    - f. Remove labels that are not permanent.
    - g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    - h. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
    - i. Leave Project clean and ready for use.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

END OF SECTION

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:

- 1. Record Drawings.
- 2. Record Specifications.
- 3. Record Product Data.
- 4. Miscellaneous record submittals.

- B. Related Sections:

- 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
- 2. Note: See individual Specification Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:

- 1. Number of Copies: Submit one set of marked-up record prints.

- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit one paper copy of each submittal.

- 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.

- E. Reports: Submit written report weekly indicating items incorporated in Project record documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding archive photographic documentation.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below 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 Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

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1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Architect for resolution.
4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy.
1. Include record Product Data directory organized by specification section number and title, electronically linked to each item of record Product Data.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the



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Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

- B. Format: Submit miscellaneous record submittals as paper copy.
  - 1. Include miscellaneous record submittals directory organized by specification section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION

SECTION 020100 - SUBSURFACE AND SOIL CONDITIONS

PART 1 - GENERAL

1. GENERAL

- A. The Owner has employed an independent Geotechnical Consultant and Testing Laboratory to perform a soil and foundation investigation for the site of this Project. The report of their findings is available for examination by Bidders at the office of the Owner.

2. USE OF DATA

- A. The information and recommendations contained in the geotechnical report were obtained by the Owner solely for the use of the Architect and the Structural Engineer in the design and preparation of Contract Documents for this Project.
- B. The report IS NOT a part of the Contract Documents. The report is available for examination by Bidders, but is not a warranty of subsurface conditions at the Site.
- C. Bidders shall visit the site and acquaint themselves with all existing conditions prior to bidding. Bidders may, at their own expense, perform their own subsurface investigations; however, all such investigations must be performed under time schedules and arrangements approved in advance by the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 024110 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Demolition and removal of selected portions of existing chain-link fencing, related concrete footings and all other items indicated in Drawings at Freeman Coliseum West Gate Entrance.
  - 2. Salvage of existing items to be turned over to the Owner.
- B. Related Sections include the following:
  - 1. Division 01 Section "Summary" for use of premises.
  - 2. Division 01 Section "Temporary Facilities and Controls" for temporary construction measures.
  - 3. Division 01 Section "Construction Waste Management and Disposal" for disposal of demolished materials.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them at locations as indicated in Drawings.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner at an on-site location.

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1.5 SUBMITTALS

- A. Qualification Data: For demolition firm and refrigerant recovery technician.
- B. Schedule of Selective Demolition Activities.
- C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- D. Pre-demolition Photographs or Videotapes: Show existing conditions of adjoining construction, including finish surfaces, which might be misconstrued as damage caused by selective demolition operation.
- E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Pre-demolition Conference: Conduct conference at Project site to review methods and procedures related to selective demolition.

1.7 PROJECT CONDITIONS

- A. Owner will occupy the existing facilities immediately adjacent to selective demolition area. Conduct selective demolition so that Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

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1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials to match adjacent surfaces and in a way that will not void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and videotapes.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

3.3 PREPARATION

- A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent portions of existing facilities and to contain dust from selective demolition operations.
  - 1. Provide protection to ensure safe passage of people around selective demolition area.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction and new construction, to prevent water damage.
  - 3. Protect existing finish work that is to remain during selective demolition operations.

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4. Comply with requirements for temporary enclosures and dust control as specified in Division 01 Section "Temporary Facilities and Controls."

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction as indicated in Drawings. Use methods required to complete the Work within limitations of governing regulations.
- B. Do not demolish construction elements beyond what is indicated on Drawings.
- C. Removed and Salvaged Items:
  1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area off-site designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
  1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated in Drawings.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition operations.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them

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3.7 CLEANING

- A. Clean adjacent surfaces and spaces of dust, dirt, and debris caused by selective demolition operations. Return all areas of Project Site to condition existing before selective demolition operations began.

END OF SECTION

SECTION 034500 - ARCHITECTURAL PRE-CAST CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Extent of architectural pre-cast concrete work is shown on Drawings. Architectural pre-cast concrete includes plain, smooth-faced monolithic colored concrete miscellaneous items as shown in Drawings. Color to match precast concrete units as found at the adjacent Guard House structure.
- B. Caulking, sealants, and gaskets are specified in Division 7.
- C. Anchorages, reglets, anchors, dowels, cramps, hangers and other miscellaneous items required to install pre-cast concrete items.
- D. Sealant and grout in color as selected by Architect.

1.3 SUBMITTALS

- A. Product Data: Submit fabricator's specifications, data and instructions for manufactured materials and products. Include mix designs, certifications and laboratory test reports as required.
- B. Include water absorption test reports for units with exterior exposure.
- C. Shop Drawings: Submit shop drawings showing complete information for fabrication and installation of pre-cast concrete units. Indicate member dimensions and cross-section; fabrication tolerances; location, size and type of reinforcement, including special reinforcement and lifting devices necessary for handling and erection.
  - 1. Include erection procedure for pre-cast units, sequence of erection, and erection tolerances.
  - 2. Show layout, dimensions and identification of each pre-cast unit corresponding to sequence and procedure of installation.
  - 3. Indicate welded connection by AWS standard symbols. Detail inserts, connections and joints.



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4. Show caulked joints, including expansion joints ("soft" type) and grouted joints ("rigid" type).
  5. Show location and details of anchorage devices that are to be embedded in other construction.
  6. Indicate protective finishes for metal items including connectors.
- D. Samples: Submit samples approximately 12" x 12" x 2" to illustrate quality, color, and texture of surface finish.
1. Submit samples of cast-in anchorages and other attachments and accessories as requested by Architect.
  2. Prepare full-size sample of each type architectural pre-cast concrete unit for Architect's inspection at site prior to start of installation work, and after Architect review of finish samples. Acceptable full-size samples may be incorporated in job installation.
  3. Patching of damaged exposed face surfaces may be permitted when acceptable to Architect. Otherwise, remove and replace damaged units when patching repairs are unacceptable to Architect.
  4. Submit samples of grout color.
- E. Mock-Up:
1. Provide Pre-cast Concrete Unit mock-up for Architect's review.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except as otherwise indicated:
1. ACI 318 "Building Code Requirements for Reinforced Concrete".
  2. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
  3. Pre-stressed Concrete Institute MNL 117, "Manual for Quality Control for Plants and Production of Architectural Pre-cast Concrete Products".
  4. American Welding Society D1.4, "Structural Welding Code - Reinforcing Steel."
- B. Fabricator Qualifications: Firms which have a minimum of five years of successful experience in the fabrication of architectural pre-cast concrete units, similar to units required for this project, will be acceptable.

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Fabricator must have sufficient production capacity to produce, transport, and deliver required units without causing delay in the work.

C. Fabrication Qualifications:

1. Produce pre-cast concrete units at fabricating plant engaged primarily in manufacturing of similar units, unless plant fabrication or delivery to site is impractical.
2. If units are not produced at pre-cast concrete fabricating plant, maintain procedures and conditions for quality control equivalent to plant production.

D. Design modifications must be made to meet field conditions and to ensure proper fitting of the work, and only as acceptable to Architect. Maintain general design concept shown without increasing or decreasing sizes of members or altering profiles and alignment shown. Provide complete design calculations and drawings prepared by a professional engineer registered in State where project is located, if design modifications are anticipated.

E. Qualifications of Erector: Minimum of five years of successful experience in the erection of architectural pre-cast concrete units, similar to units required for this project.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver pre-cast concrete units to project site in such quantities and at such times to assure continuity of installation. Store units at project site to prevent cracking, distortion, warping, staining, or other physical damage and so that markings are visible. Lift and support units only at designated lifting or supporting points as shown on final shop drawings.

1.6 RELATED SECTIONS

A. Section 041000 - Mortar

PART 2 - PRODUCTS

2.1 FORMWORK

- A. Provide forms and, where required, form facing materials of metal, plastic, wood, or other acceptable material that is non-reactive with concrete and will produce required finish surfaces.
- B. Accurately construct forms, mortar-tight, and of sufficient strength to withstand pressures due to concrete placing operations and temperature changes. Maintain form work to provide completed pre-cast concrete units of shapes, lines and dimensions indicated, within specified fabrication tolerances.

2.2 REINFORCING MATERIALS

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- A. Reinforcing Bars: ASTM A-615, Grade 60, deformed.
- B. Epoxy-Coated Reinforcing Bars: ASTM A-775.
- C. Low-Alloy Steel Reinforcing Bars: ASTM A-706.
- D. Galvanized Reinforcing Bars: ASTM A-767, Class II (2. oz. zinc psf), hot-dip galvanized after fabrication and bending.
- E. Steel Wire: ASTM A-82, plain, cold-drawn, steel.
- F. Welded Wire Fabric: ASTM A-185.
- G. Welded Deformed Steel Wire Fabric: ASTM A-497.
- H. Supports for Reinforcement:
  - 1. Provide supports for reinforcement including bolsters, spacers and other devices for spacing, supporting and fastening reinforcing.
  - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C-150, Type I or Type III.
  - 1. Use only one brand, type, and source of supply of cement throughout the project, unless otherwise acceptable to Architect.
  - 2. Use "white" portland cement for facing concrete mix to match Architect's control sample.
- B. Coarse Aggregate:
  - 1. ASTM C-33 for "Severe Weathering Region"; hard, durable, carefully selected and graded; free of material causing staining or reacting with cement and with less than 5% magnesium sulfate soundness loss unless at least five years of historical experience indicates satisfactory durability.
  - 2. Use aggregate from same source as those used in Architect's control sample.
- C. Fine Aggregate: ASTM C-33; manufactured sand of same material as coarse aggregate, unless otherwise acceptable to Architect. Use white sand if necessary to white finish on all units.
- D. Pigments: Non-fading, resistant to lime and other alkalis. Color to match Architect's sample.

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- E. Water: Drinkable, free from foreign materials in amounts harmful to concrete and embedded steel.
- F. Water-Reducing Retarding, Accelerating Admixtures: ASTM C-494, Type as selected by Fabricator and containing not more than 0.1% chloride ions.

2.4 CONNECTION AND SUPPORT DEVICES

- A. Steel Plates: Structural quality, hot-rolled carbon steel, ASTM A-283, Grade C.
- B. Steel Shapes: ASTM A-36.
- C. Stainless Steel Shapes: AISI Type 302/304.
- D. Anchor Bolts: ASTM A-307, low-carbon steel bolts, regular hexagon nuts and carbon steel washers.
- E. Electrodes for Welding: Comply with AWS Code.
- F. Finish of Steel Units: Exposed units hot-dip galvanized after fabrication, ASTM A-153; inserts cast into pre-cast units hot-dip galvanized, electro-galvanized or cadmium coated, others shop painted with rust-inhibitive primer.

2.5 GROUT MATERIALS

- A. Cement Grout: Portland cement, ASTM C-150, Type I, and clean, natural sand, ASTM C-404. Mix at ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum water required for placement and hydration, color as selected by Architect.
- B. Non-Metallic Shrinkage-Resistant Grout: Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with CRD-C621.
- C. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
  - 1. Euco N.S.; Euclid Chemical Co.
  - 2. Crystex; L&M Construction Chemicals.
  - 3. Masterflow 713; Master Builders.
  - 4. Five Star Grout; U.S. Grout Corp.
  - 5. Upcon; Upco Chem. Div., USM Corp.
  - 6. Propak; Protex Industries, Inc.

2.6 SEALANTS

- A. Seal all precast concrete unit joints with sealant as specified in Section 079200.

2.7 PROPORTIONING AND DESIGN OF MIXES

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- A. Prepare design mixes for each type of concrete required.
- A. Design mixes may be prepared by independent testing facility or by qualified pre-cast manufacturing plant personnel, at pre-cast fabricator's option.
- B. Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the project for each type of concrete required, complying with ACI 318.
- C. Facing Concrete: Standard-weight concrete consisting of specified portland cement, aggregates, admixtures, and water to produce the following properties:
  - 1. Compressive Strength: 5,000 psi minimum at 28 days.
  - 2. Total Air Content: Not less than 4% nor more than 6%.
  - 3. Water Absorption: Not to exceed 5% to 6% by weight; except between 3% to 4% for sloping surfaces (sills), for improved weathering staining resistance.
- B. Back-up Concrete: same as facing concrete (monolithic).
- C. Submit written reports to Architect of proposed mix for each type of concrete at least 15 days prior to start of pre-cast unit production. Do not begin concrete production until mixes and evaluations have been reviewed by Architect.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested when characteristics of materials, job conditions, weather, test results, or other circumstances warrant. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by Architect before using in the Work.

2.8 FABRICATION

- A. General: Fabricate monolithic pre-cast concrete units complying with manufacturing and testing procedures, quality control recommendations, and following dimensional tolerances, unless otherwise indicated.
- B. Dimensional Tolerances of Finished Units: Overall height and width measured at face adjacent to mold at time of casting:
  - 1. 10'-0" or under:  $\pm$  \_".
  - 2. 10'-0" to 20'-0": +\_", -3/16".
  - 3. 20'-0" to 30'-0": +\_", -1/4".
  - 4. Each additional 10'-0":  $\pm$ 1/16" per 10'-0".

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5. Angular deviation of plane of side mold:  $1/32$ " per 3" depth, or  $1/16$ " total, whichever is greater.
  6. Openings within one unit:  $\pm 1/4$ ", except  $\pm$ " for windows and door frames.
  7. Out of square(differences in length of two diagonal measurements):  
" per 6'-0" or  $1/4$ " total, whichever is greater.
  8. Thickness: -",  $+1/4$ ".
  9. Tolerances of other dimensions not otherwise indicated:  
numerically greater of  $\pm 1/16$ " per 10'-0", or  $\pm$ ".
- C. Position Tolerances: For cast-in items measured from datum line locations as shown on reviewed shop drawings:
1. Anchors and inserts: within " of centerline location.
  2. Blockouts and reinforcements: within  $1/4$ " of position shown on shop drawings, where such positions have structural implications or affect concrete cover; otherwise within  $\pm 1/2$ ".
- D. Fabricate units straight, smooth, and true to size and shape, with exposed edges and corners precise and square unless otherwise indicated.
1. Pre-cast units which are warped, cracked, broken, spalled, stained, or otherwise defective will not be acceptable.
- E. Expansion Joints: Free of grout, mortar, or other obstructions to expansive movement, with expansion joint filler where indicated.
1. Sills: Midpoint between mullions, with expansion filler strip.
- F. Built-In Items:
1. Provide reglets, slots, holes, and other accessories in units to receive windows, cramps, dowels, reglets, waterstops, flashings, and other similar work as indicated.
  2. Provide inserts and anchorages cast into units, for attachment of loose hardware as required.
- G. Anchorages: Provide loose steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other miscellaneous steel shapes not provided by other trades, necessary for securing pre-cast units to supporting and adjacent members.
- H. Finish: Fabricate monolithic pre-cast units and provide exposed surface finishes as follows:

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1. Smooth surface finish: free of pockets, sand streaks, and honeycomb, with uniform color and texture to match Architect's control sample.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Deliver anchorage items which are to be embedded in other construction before start of such work. Provide setting diagrams, templates, instructions and directions as required for installation.
1. Do not install pre-cast units until concrete has attained its design compressive strength.
  2. Install pre-cast concrete members plumb, level, and in alignment within PCI MNL-117 specified limits of erection tolerances. Provide temporary supports and bracing as required to maintain position, stability and alignment as members are being permanently connected. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
  3. Accessories: Install ties and other accessories required for erection of pre-cast units to supporting members and back-up materials.
  4. Anchor units in final position by bolting, welding, grouting, or as otherwise indicated. Remove temporary shims, wedges, and spacers as soon as possible after anchoring is completed.
  5. Rake all mortar joints back 1/4" and provide a continuous bead of elastomeric sealant at each horizontal and vertical joint.
- B. Cleaning: Clean exposed facings to remove dirt and stains which may be on units after erection and completion of joint treatments. Wash and rinse in accordance with pre-cast manufacturer's recommendations. Protect other work from damage due to cleaning operations. Do not use cleaning materials or processes which could change the character of exposed concrete finishes.
- C. Coordinate installation of pre-cast units with other work.

3.2 ERECTION TOLERANCES

- A. Warpage: Fabricate and install wall panels so that each panel after erection complies with following dimensional requirements:
1. Bowing (concave or convex) of any part of a flat surface not to exceed length of bow/360, with a maximum of 3/4" up to 30'-0".
  2. Maximum warpage of one corner out of plane of other three, the greater of 1/16" per foot distance from nearest adjacent corner.

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3. Tolerances for Location of Pre-cast Units: Fabricate and erect pre-cast units so that joints between panels meet the following:
  - a. Face width of joints:  $\pm 3/16$ ".
  - b. Step in face:  $1/4$ ".
  - c. Jog in alignment of edge:  $1/4$ ".
  - d. Alignment for exterior panels is outside face along with face brick joints.
  - e. Variation from plumb:  $\pm 1/2$ " in any 40'-0" run.
  - f. Variation from level:  $\pm 1/2$ " in any 40'-0" run.

3.3 PERFORMANCE REQUIREMENTS

- A. Conduct inspections, perform testing, and make repairs or replace unsatisfactory pre-cast units as required. Limitations as to amount of patching which will be permitted is subject to acceptance of Architect.
- B. In addition to above, in-place pre-cast units may be rejected for any one of the following:
  1. Non-monolithic composition.
  2. Exceeding specified installation tolerances.
  3. Damaged during construction operations.
  4. Exposed-to-view surfaces which develop surface finish deficiencies.
  5. Other defects as listed in PCI MNL-117.

END OF SECTION



SECTION 041000 - MORTAR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Mortar and grout for architectural precast concrete units.
- B. Mortar admixture.

1.3 RELATED WORK

- A. Section 014000 - Quality Control: Testing laboratory services.

1.4 REFERENCES

- A. ASTM C-5 - Quicklime for Structural Purposes.
- B. ASTM C-91 - Masonry Cement.
- C. ASTM C-94 - Ready-Mixed Concrete.
- D. ASTM C-144 - Aggregate for Masonry Mortar.
- E. ASTM C-150 - Portland Cement.
- F. ASTM C-207 - Hydrated Lime for Masonry Purposes.
- G. ASTM C-270 - Mortar for Unit Masonry.
- H. ASTM C-387 - Packaged, Dry, Combined Materials, for Mortar and Concrete.
- I. ASTM C-404 - Aggregates for Masonry Grout.
- J. ASTM C-476 - Grout for Masonry.
- K. ASTM C-595 - Blended Hydraulic Cement.
- L. ASTM C-780 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- M. ASTM C-1019 - Method of Sampling and Testing Grout.
- N. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

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1.5 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Include design mix, indicate Proportion or Property method used, required environmental conditions, admixture limitations and colors available.
- C. Samples: Submit under provisions of Section 01300.
- D. Samples: Submit mortar samples, illustrating full color range.
- E. Submit test reports under provisions of Section 01400.
- F. Submit test reports on mortar indicating conformance to ASTM C-270 and C-780.
- G. Submit test reports on grout indicating conformance to ASTM C-476 and C1019.
- H. Submit manufacturer's certificate under provisions of Section 01400 that products meet or exceed specified requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect products under provisions of Section 01600.
- C. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.8 MIX TESTS

- A. Test mortar and grout in accordance with Section 01400.
- B. Testing of Mortar Mix: In accordance with ASTM C-780.
- C. Test mortar mix for compressive strength, consistency, mortar aggregate ratio, water content, air content and splitting tensile strength.
- D. Testing of Grout Mix: In accordance with ASTM C-1019.
- E. Test mortar mix for compressive strength and slump.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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- A. Rainbow Cement Co., Inc.
- B. Alamo Cement Co.
- C. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Portland Cement: ASTM C-150, Type I.
- B. Do not use masonry cement.
- C. Mortar Aggregate: ASTM C-144, standard masonry type.
- D. Hydrated Lime: ASTM C-207; type N.
- E. Quicklime: ASTM C-5, non-hydraulic type.
- F. Pre-mix Mortar: ASTM C-387, using cement, normal strength.
- G. Grout Aggregate: ASTM C-404.
- H. Water: Clean and potable.
- I. Mortar admixture: ADri-Block® by W.R.Grace or 'Gard Mortar Mix' by Krete Industries, Inc.  
Typical for all mortar mixes.

2.3 MORTAR COLOR

- A. Mortar Color: Manufacturer's standard gray.

2.4 MORTAR MIXES

- A. Mortar for Non-load Bearing Walls and Partitions: ASTM C-270, Type S, utilizing the Proportion Method to achieve 750 psi, stain/mildew-resistant.
- B. Mortar for Reinforced Masonry: ASTM C-270, Type S, utilizing the Proportion Method to achieve 750 psi, stain/mildew-resistant.

2.5 MORTAR MIXING

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM.
- B. Add mortar color and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.

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- E. Use mortar within two (2) hours after mixing at temperatures of 80 °F, or 22 hours at temperatures under 50° F.

2.6 GROUT MIXES - See Structural Drawings

2.7 GROUT MIXING

- A. Mix concrete in accordance with ASTM C-94.
- B. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Request inspection of spaces to be grouted.

3.2 PREPARATION

- A. Plug cleanout holes in concrete masonry units and pre-cast concrete units to prevent leakage of grout materials. Brace masonry for wet grout pressure.

3.3 INSTALLATION

- A. Install mortar in accordance with ASTM C-780. Install grout in accordance with ASTM C-476.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not displace reinforcement while placing grout.
- D. Remove grout spaces of excess mortar.

3.4 SCHEDULES

- A. Architectural Precast Concrete Units: Type S mortar.

END OF SECTION

SECTION 042000 - UNIT MASONRY

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. Section covers masonry, mortars, reinforcing and accessories including :
  1. Concrete masonry units and special shapes, including one-piece pilaster units.
  2. Mortar and grout.
  3. Steel reinforcing bars.
  4. Masonry joint reinforcement.
  5. Ties and anchors.
  6. Miscellaneous masonry accessories.

1.3 DEFINITIONS

- A. CMU's: Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
  1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
  2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
  1. Masonry Units: Show sizes, profiles, coursing and project-specific details. Show details and locations of special shapes.
  2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.

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- C. Samples for Initial Selection:
  - 1. Accessories
  
- D. Material Certificates: For each type and size of the following:
  - 1. Masonry units.
    - a. Include data on material properties and material test reports substantiating compliance with requirements.
  - 2. Cementitious materials. Include brand, type, and name of manufacturer.
  - 3. Pre-blended, dry mortar mixes. Include description of type and proportions of ingredients.
  - 4. Grout mixes. Include description of type and proportions of ingredients.
  - 5. Reinforcing bars.
  - 6. Joint reinforcement.
  - 7. Anchors, ties, and metal accessories.
  
- E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
  - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
  - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
  
- F. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
  
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
  
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
  
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
  
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockups for typical interior concrete masonry wall, including accessories. Size: approximately 72 inches long by 72 inches high by full thickness, including face and backup wythes, sealant joint and accessories.
  - 2. Approval of mockups is for tooling of joints and aesthetic qualities of workmanship.

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- a. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry reinforcing and accessories to prevent corrosion and accumulation of dirt and oil.

1.8 PROJECT CONDITIONS

- A. Protection of Masonry: Cover partially completed masonry when construction is not in progress and at the end of each day's work. Cover partially completed masonry when construction is not in progress.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards limit the use of chipped, cracked, or otherwise defective units to a certain percentage. Do not exceed said limits. Do not use units where such defects will be exposed in the completed Work.

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- B. Fire-Resistance Ratings: Provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Regional Materials: Provide CMU's that have been manufactured within 500 miles (800 km) of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Shapes: Provide shapes indicated in Drawings and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

- 1. Provide one-piece 16 x 8 x 16 inch pilaster units for use at new fence as detailed in Drawings.

- C. Integral Water Repellent: Provide units which are fabricated with integral water repellent.

- 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514 as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

- a. Products: Subject to compliance with requirements, provide one of the following:

- 1) Krete Industries, Inc. – “Krete Block Gard”
      - 2) Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
      - 3) Approved equal product.

- D. Concrete Masonry Units: ASTM C 90.

- 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
  - 2. Density Classification: Medium weight.
  - 3. Aggregate: conforming to ASTM C33.
  - 4. Size: shown on Drawings.
  - 5. Special Shapes: Provide cmu pilaster sections in shapes / profiles as indicated in Drawings.

2.3 MORTAR AND GROUT MATERIALS

- A. Regional Materials: Provide aggregate for mortar and grout, cement, and lime that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.



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- B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- E. Masonry Cement: ASTM C 91.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Capital Materials Corporation; Flamingo Color Masonry Cement.
    - b. Holcim (US) Inc.
    - c. Lafarge North America Inc.
    - d. Lehigh Cement Company
    - e. National Cement Company, Inc.; Coosa Masonry Cement.
- F. Mortar Cement: ASTM C 1329.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Lafarge North America Inc.
    - b. Approved equal product.
- G. Aggregate for Mortar: ASTM C 144.
  - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
  - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- H. Aggregate for Grout: ASTM C 404. First paragraph below is an example of requirement for a concrete admixture often used in cold weather as an antifreeze.
- I. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs, containing integral water repellent by same manufacturer.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Krete Industries, Inc. – “Krete Gard Mortar Mix”
    - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block Mortar Admixture.
- J. Water: Potable.

2.4 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

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- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
  - 1. Hot-dip galvanized, carbon steel.
  - 2. Wire Size for Side Rods: 0.187-inch (4.76-mm) diameter.
  - 3. Wire Size for Cross Rods: 0.187-inch (4.76-mm) diameter.
  - 4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
  - 5. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
  
- C. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
  
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
  
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
  
- D. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 1. Use portland cement-lime mortar unless otherwise indicated.
  - 2. For reinforced masonry, use portland cement-lime mortar.
  
- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
  
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is needed to provide required compressive strength of masonry.
  - 1. For reinforced masonry, use Type S.

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- D. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
  2. Proportion grout in accordance with ASTM C 476, Table 1 , for not less than 2000 psi (14 MPa).
  3. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) as measured according to ASTM C 143/C 143M.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work. Rectify said conditions before proceeding with the work.
  2. Verify that foundations are within tolerances specified.
  3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction to verify locations of electrical conduits.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. Build recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and cut edges concealed.

#### 3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
  2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).

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3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).
5. Tool all joints. Joints to have a concave profile.

### 3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow CMU's as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool all joints. Joints to have a tooled flush profile.

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3.5 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
  - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
- B. Provide continuity at corners by using prefabricated L-shaped units.
- C. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets and other special conditions

3.6 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  - 2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

3.7 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
- B. Inspections: Level 2 special inspections according to the "International Building Code."
  - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  - 3. Place grout only after inspectors have verified proportions of site-prepared grout.

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- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- G. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- I. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

3.8 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of panel unclean for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on masonry surfaces.

3.9 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

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- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.
- C. Refer to Section 017419 for additional construction waste management and disposal requirements.

END OF SECTION

SECTION 071113 - BITUMINOUS DAMPPROOFING

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. This Section includes the following:
  - 1. Cold-applied, emulsified-asphalt dampproofing.
- B. Related Sections include the following:
  - 1. Division 04 Section "Unit Masonry".

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.
- B. Material Certificates: For each product, signed by manufacturers.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.



## PART 2 - PRODUCTS

### 2.1 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Henry Company.
  - 2. Karnak Corporation.
  - 3. Koppers Inc.
  - 4. Meadows, W. R., Inc.
- B. Trowel Coats: ASTM D 1227, Type II, Class 1.

### 2.2 MISCELLANEOUS MATERIALS

- A. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.
- B. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.
- C. Patching Compound: Manufacturer's fibered mastic of type recommended by dampproofing manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
  - 1. Proceed with dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.
  - 2. Test for surface moisture according to ASTM D 4263.

### 3.2 PREPARATION

- A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.
- C. Apply patching compound for filling and patching tie holes, honeycombs, reveals, and other imperfections.

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3.3 APPLICATION, GENERAL

- A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
  - 1. Apply additional coats if recommended by manufacturer or if required to achieve coverages indicated.
  - 2. Allow each coat of dampproofing to cure 24 hours before applying subsequent coats.
- B. Apply dampproofing to provide continuous plane of protection on interior face of above-grade, exterior masonry walls.
  - 1. Continue dampproofing through intersecting walls by delaying construction of intersecting walls until dampproofing is applied. Use two-step, troweled application. Apply dampproofing at a rate recommended by Manufacturer.
- C. Apply dampproofing to provide continuous plane of protection on the entire exterior face / surface of all wall gypsum sheathing.
  - 1. Provide two coats of troweled-applied dampproofing in accordance with, and at a rate as per Manufacturer's written instructions / recommendations.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. On Exterior Face of Gypsum Wall Sheathing at Exterior Metal-Framed Walls: Apply dampproofing by trowel using a two-coat process at a rate recommended by Manufacturer over entire exterior surface of sheathing.
- B. At all other locations indicated in Drawings: Apply dampproofing by trowel using a two-coat process at a rate recommended by Manufacturer over entire exterior surface.

3.5 CLEANING

- A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

END OF SECTION

SECTION 079200 - JOINT SEALANTS

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. Section Includes:
  - 1. Joint sealants.
- B. Related Sections:
  - 1. Division 04 Section "Architectural Precast Concrete" for sealing joints.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
  - 1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  - 2. Submit not fewer than six pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
  - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
  - 5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
  - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
  - 2. Conduct field tests for each application indicated below:
    - a. Each kind of sealant and joint substrate indicated.

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3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
  - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
    - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

#### 1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
  1. Joint-sealant application, joint location, and designation.
  2. Joint-sealant manufacturer and product name.
  3. Joint-sealant formulation.
  4. Joint-sealant color.
- E. Qualification Data: For qualified Installer.
- F. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- G. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

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- I. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
  - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- J. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- K. Field-Adhesion Test Reports: For each sealant application tested.
- L. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
  - 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- E. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

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1.7 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Ten years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
  - 1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
  - 3. Mechanical damage caused by individuals, tools, or other outside agents.
  - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
  - 1. Architectural Sealants: 250 g/L.
  - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

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1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- F. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

## 2.2 JOINT SEALANTS

- A. Sealant II: Dow Corning Corp. 790, single-component, neutral-curing, non-sag silicone sealant. Typical at all exterior applications, including architectural precast concrete joints.

## 2.3 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), or either of the two types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings as required to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- D. Install sealants using industry-proven techniques.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Provide concave joint profiles.

### 3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
  - 1. Extent of Testing: Test completed and cured sealant joints as follows:
    - a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
    - b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter or 1 test per each floor per elevation.
  - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.



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3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion.

3.7 JOINT-SEALANT SCHEDULE

- A. Sealant I: Typical at all architectural precast concrete unit joints to provide a water-tight installation.

END OF SECTION

SECTION 092400 - PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Portland cement plaster with field-applied painted finish.
  - 2. Metal lath and accessories
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 4 Section "Unit Masonry".
  - 2. Division 9 Section "Painting".
  - 3. Division 32 Section "Metal Fences and Gates".

1.2 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each product specified.
- C. Samples for initial selection actual units or sections of units at least 12 inches (300 mm) square showing the full range of colors, textures, and patterns available for each type of finish indicated.
- D. Sample units of at least 12 inches square of each type of finish indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
- E. Material Certificates: Submit certificate signed by manufacturer for each kind of plaster aggregate certifying that materials comply with requirements.

1.3 QUALITY ASSURANCE

- A. Mockups: Prior to installing plaster work, construct panels for each type of finish and application required to verify selections made under Sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
  - 1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Architect.
  - 2. Obtain Architect's approval of mockups before start of plaster Work.

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3. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed portland cement plaster Work.
  - a. When directed, remove mockups from Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cementitious materials to Project site in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.
- B. Store materials inside, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.
- B. Cold-Weather Requirements: Provide heat and protection, temporary or permanent, as required to protect each coat of plaster from freezing for at least 24 hours after application. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.
- C. Warm-Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dry out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.
- D. Exterior Plaster Work: Do not apply plaster when ambient temperature is below 40 deg F (4 deg C).
- E. Protect contiguous work from soiling and moisture deterioration caused by plastering. Provide temporary covering and other provisions necessary to minimize harmful spattering of plaster on other work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Metal Framing and Supports:

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- a. Alabama Metal Industries Corp. (AMICO).
  - b. American Studco, Inc.
  - c. Angeles Metal Systems.
  - d. California Expanded Metal Products Co.
  - e. Clark Steel Framing, Inc.
  - f. Consolidated Systems, Inc.
  - g. Dale//Incor Industries, Inc.
  - h. Dietrich Industries, Inc.
  - i. Marino-Ware Industries.
  - j. National Gypsum Co.
  - k. Unimast, Inc.
  - l. Western Metal Lath Co.
2. Expanded-Metal Lath:
- a. Alabama Metal Industries Corp. (AMICO).
  - b. California Expanded Metal Products Co.
  - c. Dale//Incor Industries, Inc.
  - d. Dietrich Industries, Inc.
  - e. National Gypsum Co.
  - f. Unimast, Inc.
  - g. United States Gypsum Co.
  - h. Western Metal Lath Co.
3. Metal Accessories:
- a. Alabama Metal Industries Corp. (AMICO).
  - b. California Expanded Metal Products Co.
  - c. Dale//Incor Industries, Inc.
  - d. Delta Star, Inc.
  - e. Flannery, Inc.
  - f. Fry Reglet Corporation.
  - g. Gordon, Inc.
  - h. Metalex (Keene Products).
  - i. MM Systems Corp.
  - j. National Gypsum Co.
  - k. Pittcon Industries.
  - l. Stockton Products.
  - m. Unimast, Inc.
  - n. United States Gypsum Co.
  - o. Western Metal Lath Co.
4. Stucco:
- a. California Stucco Products Corp.
  - b. Florida Stucco Corp.
  - c. Highland Stucco.
  - d. IPA Systems, Inc.
  - e. United States Gypsum Co.

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2.2 LATH

- A. Expanded-Metal Lath: Comply with ASTM C 847 for material, type, configuration, and other characteristics indicated below.
  - 1. Material: Fabricate expanded-metal lath from sheet metal conforming to the following:
    - f. Galvanized Steel: Structural-quality, zinc-coated (galvanized) steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) minimum coating designation, unless otherwise indicated.
  - 2. Diamond-Mesh Lath: Comply with the following requirements:
    - a. Configuration: Self-furring.
      - 1) Weight: 3.4 lb/sq. yd. (1.8 kg/sq. m).

2.3 ACCESSORIES

- A. General: Comply with material provisions of ASTM C 1063 and the requirements indicated below; coordinate depth of accessories with thicknesses and number of plaster coats required.
  - 1. Galvanized Steel Components: Fabricated from zinc-coated (galvanized) steel sheet complying with ASTM A 653, G40 (ASTM A 653M, Z90) minimum coating designation.
- B. Metal Corner Reinforcement: Expanded, large-mesh, diamond-metal lath fabricated from zinc-alloy or welded-wire mesh fabricated from 0.0475-inch- (1.2-mm-) diameter, zinc-coated (galvanized) wire and specially formed to reinforce external corners of portland cement plaster on exterior exposures while allowing full plaster encasement.
- C. Cornerbeads: Small nose cornerbeads fabricated from the following metal, with expanded flanges of large-mesh diamond-metal lath allowing full plaster encasement.
  - 1. Galvanized Steel: Minimum 0.0172 inch (0.44 mm) thick.
- D. Casing Beads: Square-edged style, with expanded flanges of the following material:
  - 1. Galvanized Steel: Minimum 0.0172 inch (0.44 mm) thick.
- E. Control Joints: Prefabricated, of material and type indicated below:
  - 1. Galvanized Steel: Minimum 0.0172 inch (0.44 mm) thick.

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2. One-Piece Type: Folded pair of nonperforated screeds in M-shaped configuration, with expanded or perforated flanges.
- F. Foundation Sill (Weep) Screed: Manufacturer's standard profile designed for use at sill plate line to form plaster stop and prevent plaster from contacting damp earth, fabricated from zinc-coated (galvanized) steel sheet.
- B. Lath Attachment Devices: Material and type required by ASTM C 1063 for installations indicated.

#### 2.4 PLASTER MATERIALS

- A. Base-Coat Cements: Portland cement, ASTM C 150, Type I.
- B. Job-Mixed Finish-Coat Cement: Material and color as indicated below:
  1. Portland cement, ASTM C 150, Type I.
- C. Cement Color: Gray.
- D. Lime: Special hydrated lime for finishing purposes, ASTM C 206, Type S; or special hydrated lime for masonry purposes, ASTM C 207, Type S.
- E. Sand Aggregate for Base Coats: ASTM C 897.

#### 2.5 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable.
- B. Bonding Agent: ASTM C 932.
- C. Asphalt-Saturated Felt: ASTM D 226, Type I (No. 15), nonperforated.
- D. Steel drill screws complying with ASTM C 1002 for fastening metal lath to wood or steel members less than 0.033 inch (0.84 mm) thick.
- E. Steel drill screws complying with ASTM C 954 for fastening metal lath to steel members 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

#### 2.6 PLASTER MIXES AND COMPOSITIONS

- A. General: Comply with ASTM C 926 for base- and finish-coat mixes as applicable to plaster bases, materials, and other requirements indicated.
- B. Base-Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume per sum of cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.
- C. Three-Coat Work over Metal Lath: Base-coat proportions as indicated below:
  1. Scratch Coat: 1 part portland cement, 0 to 3/4 parts lime, 2-1/2 to 4 parts

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aggregate.

2. Brown & Finish Coat: 1 part portland cement, 0 to 3/4 parts lime, 3 to 5 parts aggregate.

- E. Plaster to receive a field-applied painted finish.

## 2.7 MIXING

- A. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF LATH AND FURRING, GENERAL

- A. Standards: Comply with ML/SFA 920, "Guide Specifications for Metal Lathing and Furring," and with requirements of ASTM C 1063.
- B. Install supplementary framing, blocking, and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, handrails, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable written instructions of lath and furring manufacturer.
- C. Isolation: Where lathing and metal support system abuts building structure horizontally and where partition or wall abuts overhead structure, sufficiently isolate from structural movement to prevent transfer of loading from building structure. Install slip- or cushion-type joints to absorb deflections but maintain lateral support.
  1. Frame both sides of control joints independently and do not bridge joints with furring and lathing or accessories.
- D. Install additional framing, furring, runners, lath, and beads, as required to form openings and frames for other work as indicated. Coordinate support system for proper support of framed work that is not indicated to be supported independently of metal furring and lathing system.

### 3.2 LATHING

- A. Install metal lath for the following applications where plaster base coats are required. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated that comply with referenced ML/SFA specifications and ASTM lathing installation standards.
  1. Suspended and furred ceilings using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, diamond-mesh lath.

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2. Exterior sheathed wall surfaces using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, self-furring, diamond-mesh lath.

### 3.3 PREPARATIONS FOR PLASTERING

- A. Clean plaster bases and substrates for direct application of plaster, removing loose material and substances that may impair the Work.
- B. Apply bonding agent on concrete and concrete unit masonry surfaces indicated for direct plaster application; comply with manufacturer's written instructions for application.
- C. Install temporary grounds and screeds to ensure accurate rodding of plaster to true surfaces; coordinate with scratch-coat work.
- D. Refer to Division 6 Sections for installing permanent wood grounds, if any.
- E. Flashing: Refer to Division 7 Sections for installing flashing as indicated.
- F. Surface Conditioning: Immediately before plastering, dampen concrete and concrete unit masonry surfaces that are indicated for direct plaster application, except where a bonding agent has been applied. Determine and apply amount of moisture and degree of saturation that will result in optimum suction for plastering.

### 3.4 INSTALLATION OF PLASTERING ACCESSORIES

- A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and in alignment during plastering. Install accessories of type indicated at following locations:
  1. External Corners: Install corner bead and reinforcement at external corners.
  2. Terminations of Plaster: Install foundation screeds beads along bottom edges of all plaster surfaces.
  3. Reveals: Install 1/2" reveals at locations indicated in Drawings.

### 3.5 PLASTER APPLICATION

- A. Plaster Application Standard: Apply plaster materials, composition, and mixes to comply with ASTM C 926.
- B. Do not use materials that are frozen, caked, lumpy, dirty, or contaminated by foreign materials.
- C. Do not use excessive water in mixing and applying plaster materials.



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- D. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces, as measured by a 10-foot (3-m) straightedge placed at any location on surface.
- E. Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, and before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches (152 mm) at each jamb anchor.
- F. Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.
- G. Plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated.
- H. Corners: Make internal corners and angles square; finish external corners flush with corner beads on interior work, square and true with plaster faces on exterior work.
- I. Number of Coats: Apply plaster of composition indicated, to comply with the following requirements:
  - 1. Three Coats: Over the following plaster base:
    - a. Metal lath.
- J. Finish Coats: All plaster surfaces are to receive a field-applied painted finish.

### 3.6 CUTTING AND PATCHING

- A. Cut, patch, replace, repair, and point up plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point-up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar defects. Repair or replace work as necessary to comply with required visual effects.

### 3.7 CLEANING AND PROTECTING

- A. Clean and repair surfaces stained, marred or otherwise damaged during plastering work. When plastering work is completed, remove unused materials, containers, equipment, and plaster debris.
- B. Provide final protection to ensure plaster work is without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 099100 - PAINTING

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. This Section includes surface preparation and the application of paint systems on substrates including, but not limited, to the following:
  - 1. Galvanized metal fencing components, including, but not limited to, steel tube supports, rails, pickets, fittings, metal plates, clips, anchors and fasteners.
  - 2. Cement Plaster.
- B. Related Sections include the following:
  - 1. Section 323121, Metal Fencing.
  - 2. Section 092400, Portland Cement Plastering
- C. Colors: Allow for a multi-color paint scheme throughout Project surfaces as follows:
  - 1. Provide for a maximum of 3 (three) custom colors as selected by Architect.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each type of paint system and each color and gloss of topcoat indicated.
- C. Product List: For each product indicated, include the following:

1.4 QUALITY ASSURANCE

- A. MPI Standards:
  - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
  - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

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- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Final approval of color selections will be based on benchmark samples.
    - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
  - 1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Benjamin Moore & Co.
  - 2. Coronado Paint.
  - 3. ICI Paints.
  - 4. Kelly-Moore Paints.
  - 5. Kwal-Howells Paint.
  - 6. PPG Architectural Finishes, Inc.

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7. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide premium-quality materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: Maximum of 3 exterior custom colors as selected by Architect from manufacturer's full range. Paints in subsequent articles are specified by reference to MPI paint categories.

2.3 ELASTOMERIC COATINGS

A. Exterior flat waterborne pigmented elastomeric coating: #MPI 113. Typical for use at all cement plaster surfaces.

1. Surface profile: Fine texture.
2. VOC Content: 100g/l or less.

2.4 METAL PRIMERS

A. Waterborne Galvanized-Metal Primer: MPI #134. Typical for use on all galvanized metal fencing components, including steel tube supports, pickets, rails and fittings.

1. VOC Content: E Range of E2
2. Environmental Performance Rating: EPR 2

2.5 EXTERIOR ALKYD PAINTS

A. Exterior Alkyd Enamel (Semigloss): MPI #94 (Gloss Level 5). Typical for use on all galvanized metal fencing components, including steel tube supports, pickets, rails and fittings.

1. VOC Content: E Range of E2

2.6 MISCELLANEOUS MATERIALS

A. Crack Fillers: Manufacturer-recommended elastomeric coating, factory-formulated crack fillers or sealants, including crack filler primers, compatible with substrate and other materials indicated. VOC content complying with limits of authorities having jurisdiction.

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- B. Crack Filler Primer: Manufacturer-recommended, elastomeric coating, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized metal components to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- E. Cement Plaster Crack Repair: Fill all cracks according to Manufacturer's written instructions prior to applying elastomeric coating.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

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- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Apply elastomeric coating in accordance with Manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
  - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
  - 2. Testing agency will perform tests for compliance of paint materials with product requirements.
  - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 PAINTING SCHEDULE

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A. Galvanized-Metal Substrates:

1. Alkyd System: MPI EXT 5.3B.
  - a. Prime Coat: Waterborne galvanized-metal primer.
  - b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
  - c. Topcoat: Exterior alkyd enamel (semigloss).

B. Cement Plaster Substrates:

1. Primer: Stucco of primer as recommended by Manufacturer.
2. Elastomeric Finish Coats: Minimum two coats with total dry film thickness of 16 to 18 mils.
3. Finish Coat Color: As selected by Architect from Manufacturer's full color range.

C. All other exterior exposed surfaces not specifically mentioned above:

1. One coat primer as recommended by Manufacturer for the specific substrate.
2. Two coats latex or alkyd enamel as directed by Architect (satin).

END OF SECTION

SECTION 323111 - INDUSTRIAL ALUMINUM CANTILEVER GATE SYSTEM

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. Gate System Description

- 1. Provide complete, engineered, vehicular, bi-parting and single-leaf industrial cantilever gate systems. Engage the services of a state-licensed, professional (specialty) engineer to design complete gate systems, including concrete footings. to comply with all applicable local codes. All cantilever gate system components shall be pre-finished in "black" color to match the adjacent metal fencing.

B. Gate System shall include:

- 1. Gate leaf panels set behind masonry pillars and steel posts.
- 2. Overhead enclosed track.
- 3. Posts and bracing.
- 4. Hardware and Accessories, including heavy-duty lockable latches.
- 5. Concrete footings.
- 6. All other components as required for a complete and fully-functional gate system.

C. Related Sections:

- 1. Section 323121 "Metal Fencing".

1.3 REGULATORY REQUIREMENTS

- A. The work of this Section shall comply with the 2015 International Building Code and with all other applicable local codes, as well as, with ASTM F2200 and UL 325 standards.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include gate plans, elevations, sections, details, and attachments to other work. Include design calculations, details, methods of connection and concrete footings as signed and sealed by the professional engineer.



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- C. Samples: For each gate component or material and for each color specified
  - 1. Provide Samples 12 inches in length for linear materials.
  - 2. Provide Samples 12 inches square for sheet or plate materials.
- D. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for gates that must provide emergency access. Provide key boxes as specified at each gate location.
- C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
  - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 REFERENCES

- A. ASTM B221 Aluminum and Aluminum -Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- B. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- C. ASTM F1184 - Industrial & Commercial Horizontal Slide Gates.

1.7 WARRANTY

- A. All gate components shall be warranted within the specified limitations, by the Manufacturer for a minimum period of 2 years from the date of substantial completion of this Project.
- B. Finish shall carry a 20-year warranty against cracking, peeling, chipping, blistering or corrosion.

1.8 DELEGATED DESIGN BY THE PROFESSIONAL (SPECIALTY) ENGINEER

- A. Detailing, methods of connection and concrete footings shall be designed by a Gate Manufacturer-engaged professional (specialty) engineer licensed to practice in the state of Texas. Submit field erection details and design calculations bearing the engineer's seal and signature with the gate submittal for Architect's review.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER /SYSTEM:

- A. Provide Ameristar's "TransPort II" design, "Montage II, Majestic" style, 4-rail, 6ft.- high, engineered cantilever gate systems or approved equal.

### 2.2 MATERIAL

- A. The materials used for the cantilever gate framing, including uprights, diagonal bracing and pickets, shall be fabricated from ASTM B221 aluminum with a yield strength of 25,000 psi, a tensile strength of 30,000 psi and a standard mill finish. The track rails shall be manufactured from ASTM B221 aluminum with a minimum yield strength of 25,000 psi, a tensile strength of 30,000 psi and a standard mill finish.
- B. Material for diagonal bracing and uprights shall be 2" sq. x 1/4" aluminum. The design of the top and bottom enclosed track shall conform to the Manufacturer's 5" x 2" fast-track system.
- C. Pickets shall be fabricated from 1" x 1/8" wall aluminum.
- D. Internal roller truck assembly shall be self-aligning. swivel ball-and-socket type running on four bearing wheels. Internal roller truck assembly shall be affixed to the hanger bracket by means of a 5/8" diameter industrial-grade rod end/center bolt, with a minimum static load rating of 10,000 lbs. Attachment of the center bolt to the truck body shall be by means of a swivel joint to ensure equivalent and consistent loading on all bearing wheels and internal track surfaces throughout the travel of the gate.
- E. Concrete Footings: as designed by the Manufacturer's specialty engineer.
- F. Finish: Gate panels, posts and all other components shall be finished with a high-temperature, in-line, multi-stage and multi-layer system, including, as a minimum, a six-stage pre-treatment / wash, and an electrostatic spray application of a polyester finish. The top coat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils. Color shall be "black" to match adjacent metal fencing.

### 2.3 MISCELLANEOUS MATERIALS

- A. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Division 03 Section "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum aggregate size or dry, packaged, normal-weight concrete mix complying with ASTM C 387 mixed with potable water according to manufacturer's written instructions.
- B. Non-shrink Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107 and specifically recommended by manufacturer for exterior applications.

## 2.4 GROUNDING MATERIALS

- A. Grounding Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
  - 1. Material above Finished Grade: Copper.
  - 2. Material on or below Finished Grade: Copper.
  - 3. Bonding Jumpers: Braided copper tape, 1 inch wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Grounding Connectors and Grounding Rods: Comply with UL 467.
  - 1. Connectors for Below-Grade Use: Exothermic-welded type.
  - 2. Grounding Rods: Copper-clad steel.
    - a. Size: 5/8 by 96 inches (16 by 2440 mm).

## 2.5 FABRICATION

- A. Pickets, enclosed track, uprights and diagonal bracing shall be pre-drilled and labeled for easy assembly. All components shall be pre-cut to specified lengths.
- B. Top and bottom rail extrusions shall be mechanically fastened to vertical uprights and reinforced with diagonal braces.
- C. All cantilever gate components shall be provided with a factory-applied, finish as specified herein.

## 2.6 ACCESSORIES

- A. Key Box: "Knox-Vault" Series 4400, single-lock model, heavy-duty, 1/4" steel plate housing, 5/8" thick steel door with interior gasket seal and stainless steel hinge. high-security UL Listed "Medeco" lock, "Knox-Coat" finish, aluminum color, recessed mount with alarm-tamper switches, additional rust and corrosion protection complete with recessed mounting kit. Set key box into grouted masonry fence pillar to be flush with cement plaster finish. Provide one key box at each gate location. Install key box in accordance with Manufacturer's written instructions and recommendations. Comply with local codes and regulations.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. All new gate installations shall be laid out by the Contractor in accordance with the Manufacturer's shop drawings.
- B. All hardware shall be installed in accordance with the Manufacturer's written instructions.

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- C. Gate stops shall be installed on each track as shown on the Manufacturer's gate shop drawings.

### 3.2 GATE INSTALLATION

- A. Gate posts shall be spaced according to the Manufacturer's gate shop drawings. Posts shall be set in concrete footings of a size as determined by the Manufacturer's professional engineer. The fence Manufacturer's gate shop drawings shall identify the necessary gate hardware required. All gate hardware shall be provided and sized by the gate Manufacturer and shall be installed in accordance with the Manufacturer's written instructions and recommendations.

### 3.3 ADJUSTING

- A. Gates: Adjust cantilever gates to operate smoothly, easily and quietly, free of binding, warp, excessive deflection, distortion, non-alignment, misplacement, disruption or malfunction. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

### 3.4 GROUNDING AND BONDING

- A. Gate Grounding:
  - 1. Gates within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet .
    - a. Gates and Other Fence Openings: Ground fence on each side of opening.
      - 1) Bond metal gates to gate posts.
      - 2) Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
  - B. Protection at Crossings of Overhead Electrical Power Lines: Ground gate at location of crossing and at a maximum distance of 150 feet on each side of crossing.
  - C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to gate with No. 6 AWG conductor. Connect conductor to each gate component at the grounding location.
  - D. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
  - E. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

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1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.5 FIELD QUALITY CONTROL

- A. Grounding-Resistance Testing: Engage a qualified testing agency to perform tests and inspections.
  1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.
  2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.
  3. Report: Prepare test reports certified by a testing agency of grounding resistance at each test location. Include observations of weather and other phenomena that may affect test results.

3.6 CLEANING & PATCHING

- A. The Contractor clear the Project Site of all excess construction materials and debris.
- B. Once fence installation is complete, patch and/or repair all surrounding pavements to their original condition.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's personnel to adjust and maintain gates.

END OF SECTION

SECTION 323121 - METAL FENCING

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. Section Includes:
  - 1. Custom-fabricated steel fencing panels set between masonry pillars and intermediate steel tube posts.
  - 2. Accessories & Hardware.
  - 3. Engineered details and methods of connection by Contractor's professional (Specialty) engineer in compliance with local codes.
- B. Related Sections:
  - 1. Division 09 Section "Painting" for field-applied painted finish on all steel fence components.

1.3 REGULATORY REQUIREMENTS

- A. The work of this Section shall comply with the 2015 International Building Code and with all other applicable local codes.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For fencing and gates. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each fence material and for each color specified
  - 1. Provide Samples 12 inches in length for linear materials.
  - 2. Provide Samples 12 inches square for sheet or plate materials.
- D. Welding certificates.

1.5 QUALITY ASSURANCE

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- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel".
- C. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for gates that must provide emergency access.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
  - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELEGATED DESIGN BY THE CONTRACTOR'S PROFESSIONAL ENGINEER

- A. Engage the services of professional (specialty) engineer licensed to practice in the State of Texas to develop details and methods of connection for the metal fencing and to make allowances for the expansion and contraction of metal fencing components.

1.7 WARRANTY

- A. All fencing components shall carry a warranty against all labor and material defects for a minimum period of 2 years from the date of substantial completion for this Project.

PART 2 - PRODUCTS

2.1 STEEL AND IRON

- A. Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dipped galvanized.
- B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010, hot-dipped galvanized.
- C. Tubing: ASTM A 500, cold formed steel tubing, hot-dipped galvanized.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 50 (Grade 340), with G90 (Z275) coating.

2.2 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

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- B. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Division 03 Section "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum aggregate size or dry, packaged, normal-weight concrete mix complying with ASTM C 387 mixed with potable water according to manufacturer's written instructions.
- C. Non-shrink Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107 and specifically recommended by manufacturer for exterior applications.

2.3 GROUNDING MATERIALS

- A. Grounding Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
  - 1. Material above Finished Grade: Copper.
  - 2. Material on or below Finished Grade: Copper.
  - 3. Bonding Jumpers: Braided copper tape, 1 inch wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Grounding Connectors and Grounding Rods: Comply with UL 467.
  - 1. Connectors for Below-Grade Use: Exothermic-welded type.
  - 2. Grounding Rods: Copper-clad steel.
    - a. Size: 5/8 by 96 inches (16 by 2440 mm).

2.4 STEEL FENCE

- A. Steel Fences: Fences consisting of hot-dipped galvanized steel components including, but not limited to, steel tubes pickets, supports and rails as detailed in Drawings.
- B. Posts: Square steel tubing, hot-dipped galvanized.
  - 1. Intermediate Fence Posts and Swing Gate Posts: Size as shown in Drawings, 3/16" wall thickness
- C. Rails: Steel tubes, hot-dipped galvanized.
  - 1. Steel Tube Rails: Size as shown in Drawings; wall thickness: 3/16"
- D. Pickets: 1" x 1" x 0.083" steel tubes, hot-dipped galvanized; size as shown in Drawings. Spacing as shown in Drawings.
- E. Fasteners: Hot-dipped galvanized, of type and size indicated in Drawings.
- F. Fabrication: Assemble fences into sections by welding pickets to rails.
  - 1. Fabricate sections with clips welded to rails for fastening to masonry pillars and intermediate posts in field.
  - 2. Drill posts and clips for fasteners before finishing to maximum extent possible.



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- G. Finish exposed welds to comply with NOMMA Guideline 1, Finish #2 - completely sanded joint, some undercutting and pinholes okay.
- H. Galvanizing: Hot-dip galvanize all fencing components to comply with ASTM A 123/A 123M. For hardware items, hot-dip galvanize to comply with ASTM A 153/A 153M.
- I. Finish for all galvanized steel fence components : Field-applied painted finish.
- J. Hardware: Provide all necessary hardware components for a complete and fully-functional installation.

2.5 ACCESSORIES

- A. Key Box: "Knox-Vault" Series 4400, single-lock model, heavy-duty, 1/4" steel plate housing, 5/8"-thick steel door with interior gasket seal and stainless steel hinge, high-security, UL Listed "Medeco" lock, "Knox-Coat" finish, aluminum color, recessed mount with alarm-tamper switches, additional rust and corrosion protection complete with recessed mounting kit. Set key box into grouted masonry fence pillar to be flush with cement plaster finish. Provide one key box at each gate location. Install key box in accordance with Manufacturer's written instructions and recommendations. Comply with local codes and regulations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.
- B. Before fence installation begins, the Contractor's land surveyor shall layout all new fence lines and gate openings utilizing chalk lines on existing asphalt and concrete pavements for Owner's final review and approval. Owner shall be allowed to make minor changes to the layout of the fence and to the location of gate openings at no additional cost to the Owner.
- C. Do not begin installation before final grading is completed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Indicate locations of utilities, underground structures, benchmarks, and property monuments.

### 3.3 FENCE INSTALLATION

- A. Attach fence panels to masonry pillars and intermediate steel posts as per the Contractor's professional engineer's details. Peen threads of bolts after assembly to prevent removal. Make allowances for expansion and contraction of steel fence components. Space fence masonry pillars and intermediate steel posts in accordance with the Drawings. Changes in finish grade shall be addressed by the stair-stepping of fence panels. Fence panels shall be attached to masonry pillars and intermediate posts as indicated in Drawings. All masonry pillars shall bear onto a concrete base / footing as indicated in Drawings; and all intermediate steel posts shall be set into concrete footings of a size as indicated in Drawings. All cuts made to steel fencing components shall receive a coating of zinc-rich primer for complete coverage; and once dry shall receive two coats of paint finish in color to match rest of fence.

### 3.4 GROUNDING AND BONDING

- A. Fence Grounding:
1. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet .
    - a. Gates and Other Fence Openings: Ground fence on each side of opening.
      - 1) Bond metal gates to gate posts.
      - 2) Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.
- C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location.
- D. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- E. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
  2. Make connections with clean, bare metal at points of contact.
  3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
  5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.5 FIELD QUALITY CONTROL

- A. Grounding-Resistance Testing: Engage a qualified testing agency to perform tests and inspections.
  - 1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.
  - 2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.
  - 3. Report: Prepare test reports certified by a testing agency of grounding resistance at each test location. Include observations of weather and other phenomena that may affect test results.

3.6 CLEANING & PATCHING

- A. The Contractor shall clear the Project Site of all excess construction materials and debris.
- B. Once fence installation is complete, patch all adjacent pavements to their original condition.

END OF SECTION